Art. XXXVII.—*Attempted Division of British Insects into Natural Orders.* By Edward Newman.

Note.—In a few instances the connexions in the following arrangement would have been imperfect without an allusion to exotic genera; such exotic genera, or higher divisions, as may occur, are invariably inclosed by parentheses. In the following table those orders to which an asterisk is attached are merely designated, not described. The expression "Larva and pupa unknown," simply signifies that they are unknown to the author, not to invalidate, in the slightest degree, descriptions which may have been given of them elsewhere.

TABLE OF THE ARRANGEMENT.

Hexapoda Tetraptera.

AMORPHA

I. Lepidoptera
- *Sphingina*
  - Sphingites
- *Papilionina*
  - Hesperites
  - Erycinites*
  - Coliites*
  - (Heliconiites)*
  - Papilionites
  - Nymphalites*
  - (Morphites)*
- *Geometrina*
  - Geometrites
- *Noctuina*
  - Phytometrites
  - Catocalites*
  - Noctuites
- *Phalænina*
  - Arctiites
  - Bombycites
  - Phalænites
  - Notodontites
  - Cossites
  - Ægeriites
- *Pyralina*
  - Glancopites
  - Pyralites
  - Crambites
- *Tineina*
  - Yponomeutites
  - Tortricites
  - Tineites
  - Alucitites

Pulicites*

II. Diptera
- *Tipulina*
  - Cecidomiites
  - Tipulites
  - Mycetophilites
  - Rhyphites
  - Bibionites
  - Scatopsites
- *Culicina*
  - Simuliites
  - Sphæromiites*
  - Ceratopogonites*
  - Culicites
  - Chironomites*
  - Corethrites*
  - Psychodites
- *Tabanina*
  - Cyrtites
  - Bombyliites
  - Tabanites
  - Anthracites
  - Stomoxites
  - Conopites
  - Œstrites
- *Asilina*
  - Leptites
  - Therevites
  - Asilites
  - Midasites
  - Empites
  - Tachydromiites
  - Dolichopites
- *Syrphina*
  - Xylophagites
  - Stratiomites
  - Chrysotoxites
  - Syrphites
  - Eristalites*
  - Volucellites*
  - Rhingiites*
- *Muscina*
  - Muscites
  - Scatophagites
  - Tetanocerites
  - Tephritites
  - Phytomyzites
  - Phorites
  - Borborites
- *Hippoboscina*
  - (Carnites)
  - Hippoboscites
  - Nycteribiites

Stylopites

NECROMORPHA

III. Hymenoptera
- *Formicina*
  - Formicites
  - Mutillites
- *Sphecina*
  - Scholiites
  - Sapygites
  - Pompiliites
  - Sphecites
  - Larrites
  - (Bembicites)
  - Crabronites
- *Vespina*
  - Vespites
  - (Masarites)
- *Apina*
  - Lithurgites
  - Panurgites
  - Andrenites
  - Melliturgites
  - Apites
  - Apathites
  - Chrysites
- *Ichneumonina*
  - Proctotrupites
  - Mymarites
  - Chalcites
  - Cynipites
  - Evaniites
  - Ichneumonites
  - Braconites
- *Sirecina*
  - Sirecites
  - Xyphidriites
  - Xyelites
  - Oryssites
- *Tenthredinina*
  - Allantites
  - Hylotomites
  - Tenthredinites
  - Lydites
  - Cephites

IV. Coleoptera
- *Blapsina*
  - Blapsites
  - Helopites
  - Mordellites
  - Pyrochroites
  - Cantharites
  - Anthicites
- *Buprestina*
  - Ptinites
  - Clerites
  - Melyriites
  - Lampyrites
  - Cebrionites
  - Elaterites
  - Buprestites
- *Scarabæina*
  - Cetoniites
  - Melolonthites
  - Trogites
  - Scarabæites
  - Lucanites

Histerites
Byrrhites
Silphina
Dermestites
Ipsites
Nitidulites
Silphites
Spheridiites
Hydrophilites
Helophorites
Carabina
Gyrinites
Dytiscites
Carabites
Cicindelites
Staphylinites
Pselaphites
Scydmœnites
Chrysomelina
Endomycites
Coccinellites
Cassidites
Chrysomelites
Halticites
Galerucites
Criocerites
Cerambycina
Lepturites
Cerambycites
Cucujites
Bostricites
Curculionites
Anthribites
Salpingites

ISOMORPHA
V. ORTHOPTERA
Forficulina
Forficulites
Achetina
Achetites
Gryllina
Gryllites
Locustina
Locustites
(*Spectrina*)
(Spectrites)
(*Mantina*)
(Mantites)
Blattina
Blattites
——
Thrypsites

VI. HEMIPTERA
Cimicina
Cimicites
Hydrometrina
Hydrometrites
Nepina
Nepites
Notoneclina
Notonectites
Cicadina
Cicadites
Coccina
Coccites
Aphina
Aphites
——
Aleyrodites
——

ANISOMORPHA
VII. NEUROPTERA
Termitina
Termites
Perlina
Perlites
Raphidiina
Raphidiites
Hemerobiina
Hemerobiites
Phryganina
Phryganites
Ephemerina
Ephemerites
Libellulina
Libellulites
——
Panorpites

DIVISION I.—TETRAPTERA AMORPHA.

Larva and pupa[a] bearing no resemblance in external appearance to the imago. Pupa perfectly quiescent, having the organs of manducation and locomotion undeveloped.

SECTION I.—T. A. ADERMATA,

Which on entering the pupa state throw off the last skin of the larva, and consequently exhibit through the remaining skin the parts of the future imago.

CLASS I.—LEPIDOPTERA.

Larva with strong corneous mandibles, moving horizontally, and six articulated feet, situated in pairs on the second, third, and fourth segments: the fifth and sixth, eleventh and twelfth segments invariably with feet; the other segments each subject to the possession of a pair of fleshy prehensile feet: feeds on the leaves, bark, wood, or roots of vegetables. Imago with short, undeveloped, immovable labrum and mandibles; elongate palpigerous maxillæ, slender, flexible, and tubular; when at rest, convoluted between the labial feelers; labium triangular,

[a] In a paper read in the course of last spring, at the Linnæan Society, I have attempted to prove that the pupa is not a distinct state, but simply the matured larva; the term is, however, convenient to express that matured state.

bearing two erect conspicuous feelers: all the wings fully and nearly equally developed, and, together with the body, clothed with scales: feeds on the honey of flowers, and on fruit.

Stirps.—Sphingina.

Natural Order.—Sphingites, *Hawk-moths.*

Larva naked, of uniform substances, with ten prehensile legs, and a stout corneous recurved horn on the paratelum. Pupa smooth, rounded, generally quite naked; changes in or on the ground. Imago with the antennæ incrassated in the middle; the tips furnished with a recurved hook composed of fine bristles; wings narrow; hind wings small; body stout: flight rapid and well sustained; diurnal or nocturnal. *Scsia, Macroglossa, Smerinthus, Sphinx, Acherontia, Deilephila,* (*Castnia,*) &c.

Stirps.—Papilionina.

Natural Order.—Hesperites, *Skippers.*

Larva generally naked, stout in the middle, and attenuated at the extremities with ten prehensile legs. Pupa stout, smooth, unangulated; changes in a loose web among the leaves on which the larva feeds, attached by the tail and a thread round the middle. Imago with the antennæ partially clavated; sometimes nearly filiform, hooked at the extremity; the hind wings of the insect, when at rest, reposing in a nearly horizontal position; the fore wings nearly erect; flight diurnal, brisk, and bustling. *Hesperia, Thymele.*

Natural Order.—Papilionites, *Butterflies.*

Larva sometimes naked, but generally covered with down, hair, or spines; with ten prehensile legs. Pupa naked; mostly angulated, always attached by the tail; changes in the air. Imago with clavated antennæ not hooked; all the wings erect, and meeting above the back when at rest. *Polyommatus, Lycœna, Thecla, Amaryssus, Colias, Pontia, Apatura, Limenitis, Hipparchia, Vanessa, Argynnis,*[b] &c.

[b] This order appears to require further division, before we arrive at families; perhaps when we attain a more perfect knowledge of the anterior states of butterflies, they will be found to be divisible thus:—

Natural Orders.

I. Nymphalites.
II. Morphites.
III. Hesperites.
IV. Erycinites.
V. Coliites.
VI. Heliconites.
VII. Papilionites.

Stirps.—Geometrina.

Natural Order.—Geometrites, *Loopers*, or *Slender bodies.*

Larva naked, slender, and very elongate, with four prehensile feet; in consequence of the length of body without feet, its back is arched in walking. Pupa smooth, rounded; situation of change, various. Imago with antennæ tapering to a point; in the males often highly pectinated; wings ample, expanded; body very slender; flight in the evening, silent, feathery. *Geometra* and *Phalæna* of Haworth.

Stirps.—Noctuina.

Natural Order.—Phytometrites, *Half-loopers.*

Larva naked, elongate, less slender than the preceding, with six prehensile feet; in walking its back is arched, but not so decidedly as in the preceding. Pupa smooth, rather pointed at the tail; changes in a slight web. Imago with filiform antennæ; small deflexed wings; moderately stout body; beautifully coloured: often with brilliant metallic markings; flight at all hours; in the hottest sunshine, and at midnight. *Plusia*, *Ophiusa*, *Heliothis*, *Acontia*, *Erastria*, *Phytometra*,[c] &c.

Natural Order.—Noctuites, *Full-bodied Moths.*

Larva generally naked, cylindrical, robust, with ten prehensile feet;[d] rolls in a ring when touched. Pupa smooth; mostly changes in the ground. Imago with filiform antennæ; occasionally pectinated in the males; wings small, deflexed; body stout and heavy; colour dusky; flight very rapid; nocturnal. *Brepha*, *Catocola*, and the *Noctuidæ*. *Noctua* and *Hemigeometra* of Haworth.[e]

Stirps.—Phalænina.

Natural Order.—Arctiites, *Millers.*

Larva very hairy; sometimes with bunches, brushes, or fascicles of hairs; with ten prehensile legs; rolls in a ring when touched.

[c] This order corresponds with the genus *Phytometra* of Haworth; as he appears to have been the first, and indeed nearly the only author who considered it as decidedly distinct from the *Noctuites*, I have adopted his name.

[d] Eight only in a few.

[e] The genus *Hemigeometra* of Haworth, including *Brepha* and *Catocala*, differs in having larger wings, a more slender body, brighter colours, diurnal flight, and a half-looping larva: it may possibly, hereafter, form a distinct order, under the name *Catocalites*. The *Geometrites* and *Noctuites* still require subdivision.

Pupa, more or less hairy; changes in a cocoon composed of silk, in which the hairs of the larva are always intermixed. Imago, the males with somewhat slender bodies; more or less pectinated antennæ, and active; often flying by day; the females very heavy, sluggish, and often apterous. *Acronycta* (part), *Spilosoma*, *Arctia*, *Hypercampa*, *Lithosia* (part), *Hypogymna*, *Laria*, *Orgyia*. [f]

NATURAL ORDER.—BOMBYCITES, *Eggars.*

Larva elongate, cylindrical, of equal substance, hairy, with ten prehensile feet; rolls in a ring when touched. Pupa in a silken cocoon, more close than the preceding. Imago with pectinated antennæ in both sexes; males with slender bodies, very active, and fly by day: females heavy, sluggish, and seldom fly; predominating colour, fulvous. *Eriogaster*, *Odonestis*, *Gastropacha*, *Lasiocampa*.

NATURAL ORDER.—PHALÆNITES, *Emperor-moths.*

Larva obese, with fascicles of bristles disposed in rings on each segment. Pupa short, obtuse, flat, with bristles at the tail; changes in a tough pear-shaped cocoon, of which the smaller end remains open. Imago with highly pectinated antennæ in both sexes; wings amazingly expanded; the fore wings more or less falcate; beautifully coloured, and ocellated; body short and small; flight of the males diurnal, of the females rare, and mostly in the evening. *Saturnia*.

NATURAL ORDER.—NOTODONTITES, *Prominents.*

Larva generally naked; sometimes slightly downy; attenuated towards the tail, with eight prehensile feet; the two posterior ones being mostly wanting, and the segment usually bearing them elevated in the air. Pupa smooth, obese, compact; mostly changes in a cocoon or web, but occasionally on or in the ground. Imago with the antennæ of the males more or less pectinated; wings deflexed; flight, with few exceptions, in the evening. *Endromis*, *Cerura*, *Stauropus*, *Platypteryx*, *Cilix*, *Notodonta*, *Pygæra*, *Clostera*.

NATURAL ORDER.—COSSITES, *Wood-eaters.*

Larva depressed, rather attenuated towards either extremity; naked, except a few scattered hairs; prothorax flat and corneous; ten

[f] Those in which the larva is furnished with brushes of hair, and in which the female imago is apterous, I have elsewhere treated as a separate order; the distinctions, however, seem of very doubtful value.

prehensile feet; feeds on the bark, solid wood, pith, or roots of vegetables. Pupa furnished with a double row of short spines on each segment; it changes in a tough cocoon amongst its food, after remaining through the winter in the larva state. Imago with the antennæ of the males more or less pectinated; flight nocturnal. *Hepialus*, *Cossus*, *Zeuzera*.

Natural Order.—Ægeriites, *Clear-wings.*

Larva and pupa, in habit and economy, precisely as in the preceding. Imago with antennæ incrassated externally, and the tip furnished with a slightly recurved hook, consisting of a few bristles; in the males ciliated; wings narrow, mostly transparent; body elongate, slender, and tufted; flight diurnal, in the hottest sunshine, and eminently graceful. *Ægeria*.[g]

Stirps.—Pyralina.

Natural Order.—Glaucopites, *Burnet-moths.*

Larva obese, hairy, with ten prehensile legs. Pupa smooth, very glossy; changes in a close gummy cocoon, pointed at both ends, and attached generally to a blade of grass. Imago with clavate antennæ; slightly pectinated in the males. *Zygæna*, *Ino*.

Natural Order.—Pyralites, *Pearl-moths.*

Larva rather more slender than the foregoing, slightly hairy, with ten prehensile feet. Pupa elongate, very lively; changes in a silken cocoon. Imago with filiform antennæ; wings somewhat triangular, deflexed: legs very long, and furnished with long spurs. *Ennychia*, *Pyrausta*, *Hydrocampa*, *Botys*, *Scopula*, *Pyralis*, *Polypogon*, *Hypena*.

Natural Order.—Crambites, *Veneers.*

Larva elongate, naked, with ten prehensile feet. Pupa elongate; changes in a slight cocoon. Imago with very prominent labial feelers, filiform antennæ, sometimes pubescent; wings ample, folded round the body; flight in the evening. *Crambus*, and allied genera.

[g] The great difference between this and the preceding order, in the imago state, has induced me to propose this additional order.

Stirps.—Tineina.

Natural Order.—Yponomeutites, *Ermine-moths.*

Larva elongate, slightly hairy, with ten prehensile feet; gregarious, spinning a web; if touched, runs backwards, falls and suspends itself by a thread. Pupa elongate, smooth; changes in a cocoon amongst its food. Imago with filiform antennæ; wings folded round the body, often beautifully dotted and marked with black. *Yponomeuta*, and neighbouring genera.

Natural Order.—Tortricites, *Bell-moths.*

Larva more obese than the foregoing, slightly hairy, with ten prehensile feet; gregarious, spinning a web; if touched, runs backwards with a rapid twisting motion, and falls, hanging by a thread. Pupa elongate, attached by the tail; changes in a silken cocoon, generally amidst the web of the larva. Imago with filiform antennæ; the fore wings with a prominent shoulder, which gives the insect, when at rest, precisely the shape of a bell. *Tortrix*, and allied genera.

Natural Order.—Tineites, *Clothes-moths*, &c.

Larva elongate, with ten prehensile legs; concealed in a sack constructed by itself, which it enlarges from time to time as it increases in bulk; feeds on woollen cloths, hair, and decayed animal and vegetable substances. Pupa elongate; changes within the sack. Imago with filiform antennæ, and narrow wings; flight gregarious, rising and falling. *Tinea*, and allied genera.

Natural Order.—Alucitites, *Plume-moths.*

Larva slender, with ten prehensile feet; the anterior part capable of great attenuation and extension, in the manner of a leech. Pupa elongate; changes in a silken cocoon. Imago with filiform antennæ; wings extended at right angles with the body; very narrow, and divided to the base, each division having the appearance of a perfect and distinct feather. *Pterophorus*, *Alucita.*

Natural Order.—Pulicites, *Fleas.*

Class II.—Diptera.

Larva with minute but corneous mandibles, moving horizontally; without articulate or prehensile feet; feeds on recent or

decaying animal and vegetable substances. Imago with the parts of the mouth variously developed; the mandibles never possessing the horizontal motion, or masticatory power; the fore wings fully developed; the hind wings undeveloped; assuming the appearance of small pedunculated knobs, and denominated halteres or poisers; tarsi five-jointed.

Stirps.—Tipulina.

Natural Order.—Cecidomiites, *Hessian-fly*, &c.

Larva elongate, inhabits and feeds on the blossoms of wheat and other grain, the leaves of plants, &c. causing excrescences. Pupa changes in the same situation, in a tough case. Imago usually with moniliform antennæ, as long as the body, composed of about twelve or thirteen joints in the female, and twice as many in the male; joints nearly globular, connected by a slender filament; maxillary feelers four-jointed; labium short, obtuse, and tomentose; other parts of the mouth obsolete; wings wide, as long as the body, which they cover horizontally; female furnished with an oviduct, frequently as long as the body. *Cecidomya*, *Campylomyza*.

Natural Order.—Tipulites, *Crane-flies*.

Larva stout, very soft, attenuated anteriorly, abruptly terminated posteriorly; inhabits the earth, feeding on the roots of corn, grass, and other vegetables, or occasionally decayed wood. Pupa changes in the same situations; it has often two remarkable recurved horns porrected from its head, through which it is said to breathe; and the segments of the body are mostly armed with spines. Imago with antennæ thirteen to seventeen-jointed; frequently pectinated in the males; labium fleshy, bilobed, dilated; maxillary feelers five-jointed, moderately long, curved, the points turning outwards; the other organs of the mouth nearly obsolete; ocelli none. *Ctenophora*, *Pedicia*, *Tipula*, *Erioptera*, *Limnobia*.

Natural Order.—Mycetophilites.

Larva elongate, glabrous; inhabits and feeds on decaying fungi. Pupa changes in the same situations. Imago with antennæ sixteen-jointed, sometimes very long, moniliform, and simple in both sexes; labium and other organs of the mouth obscurely developed or obsolete; ocelli three; wings rather wide, cover the body

horizontally; body very slender, the same length as the wings; legs long. *Bolitophila*, *Macrocera*, *Synapha*, *Mycetobia*, *Platyura*, *Sciophila*, *Leia*, *Mycetophila*, *Molobrus*, *Lestrema*, *Zygoneura*.

Natural Order.—Rhyphites.

Larva very elongate, smooth, cylindrical, encompassed by eleven corneous shining rings; head furnished with two hooks; tail with four short cylindrical tubes: inhabits the earth and cow-dung. Pupa changes in the earth. Imago with filiform, sixteen-jointed, antennæ, rather longer than the head; ocelli three; maxillary feelers four-jointed; labium distinctly bilobed, other parts of the mouth not fully developed; wings broad, lying horizontally on the body, which they much exceed in length. *Rhyphus*.

Natural Order.—Bibionites.

Larva elongate, attenuated at each extremity; divisions of the segments deeply marked, and fringed with hairs; head furnished with two obtuse hooks: inhabits earth, on which it appears to feed, no other substance being found in the intestines. Pupa changes in the earth. Imago with stout, nine-jointed, antennæ, not longer than the head; maxillary feelers four or five-jointed; labium pubescent and bilobed, the other parts of the mouth obsolete; head and eyes large in the male, small in the female; ocelli three; wings frequently opaque, lying horizontally on the body, which they equal in length. In the spring every lane and meadow swarms with these insects, either sailing in the air like balloons, or settled on flowers, vegetables, paling, walls, and even on the ground. *Bibio* (*Penthetria*), *Dilophus*.

Natural Order.—Scatopsites.

Larva and pupa unknown. Imago, with antennæ, cylindric-conic, acute, twelve-jointed; labium small, pubescent, and bilobed; maxillary feelers very short, exarticulate. Inhabits flowers; is sluggish in its movements. *Scatops*.

Stirps.—Culicina.

Natural Order.—Simuliites, *Musquitoes*.

Larva aquatic; supposed to feed on vegetable substances; elongate, cylindrical, incrassated posteriorly, semi-transparent; two horns rise nearly in front of the head, and extend forwards; eyes or ocelli four; two fleshy prehensile legs appear to be placed beneath the mesothorax, and two more at the posterior extremity: its

motion in water is like that of a leech. Pupa also aquatic, but quiescent; ovate, gibbous, brown-coloured, clearly exhibiting all the parts of the future imago: four double filaments, nearly as long as the pupa, arise from the region of the prothorax on each side of the head; these are probably organs of respiration; the pupa is inclosed in a sheath, like a watch-pocket, the anterior portion alone being visible, the sheath being attached to some substance under the water. Imago, with antennæ, eleven-jointed, very short; maxillary feelers elongate, incurved, composed of four distinct joints, the fourth very long and pointed; the labrum, mandibles, and maxillæ sharp and wedge-shaped; the labium fleshy and bilobed; ocelli none; wings very wide, with stout costal nervures, and scarcely any elsewhere; legs short, and frequently hairy; tarsi four-jointed; mesothorax globose, very prominent; body short and small, colour black. Inhabits forests, woods, and all damp places, feeding on the blood of man and animals; and is perhaps the most annoying and wearisome persecutor with which mankind is acquainted. *Simulia.*

Natural Order.—Culicites, *Gnats.*

Larva elongate, carnivorous, active, aquatic. Pupa equally active, but rather shorter, and the head and prothorax much incrassated. Imago, with fourteen-jointed antennæ, plumose in the males, hairy in the females; labium slender and elongate, forming, together with the mandibles, maxillæ, tongue, and labrum, (which are all fully developed, and as long as the labium,) a porrected blood-sucking apparatus; the maxillary feelers are long, divaricating, and clavate; all the organs of the mouth exceed the antennæ in length; ocelli none; wings linear, covering the body; body narrow, linear, elongate; legs very long. Inhabits woods, &c. entering houses; feeds on the blood of man and quadrupeds. *Culex, Anopheles, (Ædes), Chironomus?*[h] *Corethra? Tanypus? Ceratopogon? Sphæromias?* The last five genera differ much in the antennæ, mouth, &c. and properly form several distinct orders.

Natural Order.—Psychodites, *Moth Gnats.*

Larva and pupa unknown. Imago, with antennæ, filiform, and perfectly simple, alike in both sexes; labium short, entire,

[h] The order *Culicites* appears to require division. The British *Culicina* may probably be divided thus: *Psychodites, Corethrites, Chironomites, Culicites, Ceratopogonites, Sphæromyites, Simuliites.*

somewhat pointed; wings deflexed, very hairy, enveloping the body laterally, and their inner margins uniting above it. *Psychoda*.

Stirps.—Tabanina.

Natural Order.—Cyrtites, *Bald-headed Flies.*

Larva and pupa unknown. Imago, with antennæ entirely concealed, so that the head appears perfectly globular; they are situated below the eyes, are very small, and seven-jointed; the basal joint is short and small, the second stout, and the remaining five united into one, which is very acute at the apex, and somewhat incrassated at the base: labium, as in the *Bombiliites* (but much smaller, shorter, and less obviously porrected), a slender elongate tube; ocelli three; wings longer than the body, but too narrow to cover it; alulæ large; prothorax and body very globose. Inhabit white thorn, furze, rushes; very seldom fly, and appear exceedingly sluggish. The body in the British genera is so soft as to indent on the slightest pressure. *Henops*, *Acrocera*. (*Cyrtus*).

Natural Order.—Bombiliites, *Unicorn Flies.*

Larva and pupa inhabit the earth; their habit and economy is imperfectly known. Imago, with antennæ, composed of seven joints; the basal and second joint short; the apical portion long, linear, and consisting of five united joints, of which the terminal one is acute; labium very long, rigid, and porrected like a horn; ocelli three; wings widely divaricating, narrow, variegated; alulæ small; legs long, slender; body short, globose, very hairy. Inhabits lanes and woods, hovering over flowers, occasionally suspended motionless in the air, and then darting away with such inconceivable velocity that no eye can follow it. *Bombylius*, (*Usia*.)

Natural Order.—Tabanites, *Gadflies.*

Larva inhabits the earth; is elongate, cylindrical; head corneous, linear, elongate, and furnished with two hooks. Pupa changes in the earth; has two tubercles anteriorly, and six sharp points near the posterior extremity. Imago, with antennæ composed of seven joints, the basal joint long and rather stout, the second minute, the remaining five of various dimensions and sizes, differing in the different genera, but also closely connected, and

corresponding apparently with the apical seta of the *Muscina;* labium large, bilobed, porrected; and the other organs of the mouth very perfectly developed; ocelli none; wing divaricating, as long as the body; alulæ large; body flat; colour griseous: male feeds on the farina of flowers; females suck the blood of man and quadrupeds. *Tabanus, Hæmatopota, Chrysops.*

Natural Order.—Anthracites.

Larva and pupa unknown. Imago, with the antennæ composed of seven joints; the basal joint long and stout, the second globular, and the remaining five frequently united into one; labium large, fleshy, bilobed, and rather porrected; the other organs less perfect than in the *Tabanites;* ocelli three; wings somewhat divaricating, long, extending beyond the body, beautifully variegated with black or brown; alulæ small; body flattened, truncate at the extremity. Inhabits the borders of woods, heaths, &c. settling, on flowers, on the farina of which it probably feeds. *Anthrax, Stygia.*

Natural Order.—Stomoxites.

Larva and pupa unknown. Imago, with the antennæ six-jointed; the basal and second joints short, the third produced inferiorly, pendulous, and received into a cavity in front of the head; the remaining joints forming a seta which is often plumose; labium very elongate, and porrected in front of the head; wings slightly divaricate; alulæ very large; body stout; colour griseous or mottled. Inhabits woods, meadows, houses, &c. feeding on the pollen of flowers and the blood of man and quadrupeds; particularly annoys horses, piercing its porrected labium through their skin; and, seeking shelter in the dwellings of man as winter approaches, draws his blood even through a worsted stocking. *Stomoxys, Bucentes.*

Natural Order.—Conopites.

Larva elongate; feeds on the bodies of humble bees. Pupa changes in the same situations. Imago, with antennæ placed on a distinct pedicle, six-jointed; basal joint long, second and third long and incrassated, the remaining ones short and decreasing to a point; labium long, porrected; wing narrow, divaricating; alulæ obsolete; body elongate, narrow, recurved. Inhabits woods, feeding on composite flowers, and occasionally, it is said, sucking the blood o cattle. *Conops. Myopa,* and *Zodion* differ essentially in the antennæ and alulæ, but perhaps belong to this order.

Natural Order.—Œstrites, *Botts.*

Larva cylindrical, oblong; feeds in the stomachs, frontal cavities, or backs of quadrupeds; when full fed it falls to the ground. Pupa changes in the earth, or, if the larva inhabit the stomach, in the dung of the animal it has preyed on. Imago, with six-jointed antennæ; basal and second joints short, scarcely distinct; third large, globose; the remaining three forming a seta, which is incrassated at the base; organs of the mouth obsolete; wings divaricating; alulæ moderately large; body pilose, short, stout. Inhabits meadows and commons, flying about cattle, and causing them much uneasiness; this is done in order to deposit its eggs, not for the purpose of attacking them: it takes no food. *Œstrus, Cuterebra.*

Stirps.—Asilina.

Natural Order.—Leptites.

Larva elongate, rather attenuated at the anterior end; inhabits funnel-shaped holes, which it constructs in loose sand, to serve as a pitfall to small insects, on which it feeds; the larva remains perfectly motionless when waiting for its prey, and so nearly resembles the surrounding soil in colour, that it is effectually concealed from observation. Pupa changes in the same situation. Imago, with antennæ five-jointed; the basal, second, and third joints short, and somewhat globose, but varying much in the genera; the fourth and fifth closely united, and forming a long, slender seta; labium large, membranous, bilobed; the maxillary feelers long, two-jointed, and porrected; ocelli three; wings long, divaricating, often spotted; alulæ obsolete; body moderately long. Inhabits moist hedges, banks of rivers, &c.; flight short, weak; preys on small insects. *Leptis, Atherix, Rhagio.*

Natural Order.—Therevites.

Larva very elongate, with two air-tubes at the posterior extremity, and the divisions of its segments very distinct; inhabits moist sand, mud and moss. Pupa changes in the same situations. Imago, with the antennæ composed of seven joints; the basal joint longer than the second, the remaining five united into one, which is acute at the apex; the labium is short, linear, and bilobed; the wings cover the body; alulæ obsolete; body very hairy. Inhabits the sand of the sea shore, roads, &c. making short flights: preys on small insects. *Thereva* (*Chryomyza.*)

Natural Order.—Asilites.

Larva inhabits the earth; it is elongate, cylindrical, slightly depressed, very smooth, and has a corneous head, which is slightly clothed with down, and armed with two hooks; the prothorax and paratelum have each a pair of spiracles: feeds on the minute insects which abound near the surface of the ground, especially at the roots of grass. Pupa changes in the same situation, without spinning any cocoon; it is very smooth, anteriorly cylindrical, posteriorly conical; the head has a bifid projection in front, and on each side below this is a trifid excrescence; the prothorax has on each side a tubercle, which seems to contain a spiracle; the body laterally, and at the extremity, is furnished with small spines. Imago, with the antennæ five-jointed; the basal and second joints moderately long, the three forming the apical portion always distinct; the terminal joint acute, but not setiform; labium large, cylindrical, and corneous; ocelli three; wings as long as the body, which they cover horizontally; alulæ obsolete; body elongate, hairy. Inhabit heath and commons very abundantly, flying a short distance at a time, settling on the ground, and preying on other insects, particularly *Diptera*. *Dasypogon*, *Asilus*, *Gonipes*.

Natural Order.—Midasites.

Larva and pupa unknown. Imago, with the antennæ five-jointed; the basal joint long, the second short and nearly globular, the three forming the apical portion united into an elongate, stout club, on which the union of the joints is marked transversely; labium longer and more acute than in the *Asilites;* maxillæ and mandible acute; ocelli nearly obsolete; wings as in the *Asilites;* legs and body hirsute. Inhabits woods, forests, settling on leaves, &c. preying voraciously on insects, particularly *Hymenoptera*. *Dioctria? Laphria?* (*Midas.*)

Natural Order.—Empites.

Larva and pupa unknown. Imago, with antennæ five-jointed; the basal joint oblong, the second nearly globular, the three forming the apical portion often united, of different proportions in different genera; labium very long, slender, recurved, contains elongate and acute maxillæ, &c. resembling very much the beak of a bird; ocelli three; wings large, particularly wide in the female; alulæ small or obsolete; body rather hairy, linear, slender. Inhabits woods, lanes, and gardens, preying on other insects. *Hilara*, *Gloma*, *Empis*, *Rhamphomyia*, *Hybos*.

Natural Order.—Tachydromites.

Larva and pupa unknown. Imago, with antennæ five-jointed; the basal and second joints oblong, the third elongate and robust, the fourth and fifth forming a seta, which is bent nearly at a right angle with the third; labium short, bilobed; ocelli three; wings very large and wide, lying horizontally on the back; body rather pilose, short, stout, pointed. Inhabits woods, hedges, and umbellate flowers, preying on dipterous and minute hymenopterous insects; black, brown, or fulvous. *Hemerodromia*, *Tachydromia*, *Platypalpus*, *Drapetis*.

Natural Order.—Dolipochites.

Larva attenuate at the extremities, elongate; inhabits moist earth and mud. Pupa changes in the same situations, having all the parts of the perfect insect distinctly visible. Imago, with the antennæ five-jointed; the basal, second and third joints robust, the fourth and fifth forming a seta: labium very stout, short, and bilobed; ocelli three; wings very large, lying horizontally over the body; alulæ obsolete; legs very long; body short and small; colour beautifully metallic green, often with a silvery pilosity. Frequents ponds and damp places in woods, preying upon small insects. *Porphyrops*, *Chrysotus*, *Dolichopus*, *Medeterus*, and several minor genera separated from these.

Section II.—T. A. Dermata.

Which, on entering the pupa state, do not throw off the last skin of the larva, and consequently do not exhibit in any degree the parts of the future imago.

Stirps.—Syrphina.

Natural Order.—Xylophagites.

Larva elongate, inhabits decaying wood. Pupa changes in the same situations: in a cocoon. Imago, with the antennæ ten-jointed; the basal and second joint are short, moderately robust, and hairy; the portion corresponding to the apical seta of the *Muscina* is robust, and composed of eight distinct joints; labium large, fleshy, and pilose; ocelli three; wings horizontally covering the body; alulæ none; hind tarsi often dilated in the males; body linear, very depressed. *Xylophagus*, *Actina*, *Beris*.

Natural Order.—Stratiomites.

Larva very elongate, attenuated at the anterior end, composed of twelve very distinct segments, besides the head; inhabits the water. Pupa changes on the surface of the water, and continues floating: no material alteration in the form takes place. Imago, with the antennæ eight-jointed; the basal and second joint are uniformly robust and hairy, the remaining six are variously formed in the genera, and sometimes indistinct; the labium is large, fleshy, and bilobed; the other organs of the mouth minute and nearly obsolete; ocelli three; wings narrow, reposing one on the other, and seldom wholly covering the body, which appears on each side; alulæ obsolete; body very flat, short, and wide. Flies in the sunshine, settling on leaves and flowers. *Stratiomys, Odontomyia, Oxycera, Nemotelus, Sargus.*

Natural Order.—Chrysotoxites.

Larva and pupa unknown; the former supposed to feed on the roots of corn, &c. Imago, with the antennæ six-jointed; basal and second joint long and slender, third very long and more robust, the remaining three forming a slender and perfectly uniform seta, which arises from near the base of the third; labium large, much dilated, bilobed; wings divaricating; alulæ small or obsolete; body very stout, convex above. Inhabit woods, &c.; fly briskly in the sunshine, settling, the males on umbellate flowers, the females on leaves. *Microdon, Chrysotoxum. Psarus? Paragus?*

Natural Order.—Syrphites.[1]

Larva always elongate, but of a variety of forms; feeds on *Aphites*, larvæ of bees and wasps, small water insects, &c. &c. Pupa changes in the habitat of the larva, excepting when aquatic; it then leaves the water, and attaches itself to some tree, wall, paling, or other vertical substance. Imago, with the antennæ six-jointed; the basal and second joint short and small, the third very large and nearly globose, the remaining three forming a perfectly uniform seta, often plumed; labium always terminated by two large, long and very distinct lobes; the other organs of the mouth distinct and fully developed; ocelli three; wings wider than in the *Stratiomites*, slightly divaricated; body convex above. Fly in the sunshine, feeding on flowers. *Ascia, Sphegina, Baccha,*

[1] The order Syrphites appears to require further division into *Syrphites, Eristalites, Volucellites,* and *Rhingites.*

Eumerus, *Psilota*, *Chrysogaster*, *Pipiza*, *Cheilosia*, *Scœva*, *Syrphus*, *Eristalis*, *Helophilus*, *Tropidia*, *Xylota*, *Spilomyia*, *Milesia*, *Merodon*, *Criorhina*, *Sericomyia*, *Volucella*, *Brachiopa*, *Rhingia*.

Stirps.—Muscina.

Natural Order.—Muscites, *Flies.*

Larva obese, but capable of great elongation and attenuation anteriorly; inhabits and feeds on dung, putrid flesh and vegetables, bark and roots of trees, recent and putrescent fungi, and the larvæ of other insects. Pupa changes in similar situations, oblong, perfectly uniform and rounded as though turned in a lathe. Imago with the apical seta of the antennæ tri-articulate; labium elongate, dilated at the extremity, retractile; alulæ of the wings distinct and conspicuous; body hairy; form obese; colour black, brown, or grey, with metallic green and blue. *Phasia*, *Gymnosoma*, *Phania*, *Miltogramma*, *Gonia*, *Trixa*, *Tachina*, *Echinomyia*, *Melanophora*, *Leucostoma*, *Metopia*, *Exorista*, *Eriothrix*, *Ocypteryx*, *Dexia*, *Mesembrina*, *Sarcophaga*, *Musca*, *Anthomyia*, *Cœnosia*, *Lispe*, and the numerous genera which have been separated from these.

Natural Order.—Scatophagites, *Dung-flies.*

Larva inhabits dung, fungi, putrid substances, and the pith of plants. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ obscurely triarticulate; labium elongate, slightly recurved, scarcely dilated, retractile; alulæ of the wings very minute; body very hairy; form oblong; colour yellow. *Scatophaga*, *Dryomyza*, *Sapromyza*.

Natural Order.—Tetanocerites.

Larva inhabits moist plants, fruits, putrid substances, also mud at the banks of ponds, rivers, and all wet places. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ exarticulate; labium short and broad; alulæ of the wings wanting; wings narrow; form elongate, often very slender: glabrous, not hairy; colour black, black with yellow spots, brown or yellowish. *Ortalis*, *Sepsis*, *Lonchœa*, *Luuxania*, *Ulidia*, *Piophila*, *Psila*, *Calobata*, *Micropeza*, *Tetanocera*, *Loxocera*, *Heteromyza*, *Platycephala*, *Sciomyza*, *Lucina*, *Chryliza*, *Lissa*, *Platystoma*, *Sepedon*, *Dorycera*, and the genera separated from these.

Natural Order.—Tephritites.

Larva inhabits galls or excrescences on the bark and leaves of plants. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ exarticulate; labium large, fleshy, bilobed, and pilose; alulæ of the wings wanting; wings rather wider than in the preceding order, beautifully variegated, striped and spotted with different shades of black and brown; body glabrous, of moderate length and stoutness, and, in the females, furnished with a large exserted and conspicuous ovipositor. *Tephritis*.

Natural Order.—Phytomyzites.

Larva inhabits the interior of plants and fruits, and sometimes putrid substances. Pupa as in the *Muscites*. Imago with the apical seta of the antennæ exarticulate; labium large, fleshy, clavate; alulæ of the wings wanting; wings as wide as in the preceding order; the body very delicate, often very slender, glabrous; colour black, or black variegated with yellow. *Phytomyza*, *Chlorops*, *Meromyza*, *Agromyza*, *Discomyza*, *Gymnopa*, *Asteia*, *Drosophila*, *Ochthiphila*, *Opomyza*.

Natural Order.—Phorites.

Larva inhabits the flowers and seeds of vegetables, and the larvæ of other insects. Pupa as in the *Muscites*. In the imago the apical seta of the antennæ is composed of four joints, the three basal ones being very short, the apical one very long; labium very short; alulæ of the wings wanting; wings very wide, extending beyond the body, which is very small, acute at the extremity, and in colour inclining to black or yellow. *Phora*.

Natural Order.—Borborites.

Larva inhabits putrid animal and vegetable substances. Pupa as in the *Muscites*. Imago, with the apical portion of the antennæ, perfectly simple and exarticulate, sometimes orbicular; labium large, membranous, and bilobed; alulæ of the wings wanting; wing very large and wide; body very small, and of a black colour. *Borborus*, *Ochthera*, *Dichæta*, *Ephydra*, *Notiphila*, *Homalura*, *Orygma*, *Cælopa*.

Stirps.—Hippoboscina.

(Natural Order.—Carnites.

Larva and pupa unknown. Imago, with antennæ, consisting of a minute tubercle, situate in a fovea before the eyes; mandibles

unknown; maxillæ short, their feelers apparently exarticulate, short, erect; ocelli none; fore-wings short, not formed for flying; hind-wings assuming the form of halteres, small, but distinct. Inhabits the common starling. The only species at present described is *Carnus hæmapterus*.)

Natural Order.—Hippoboscites.

Larva, apod and nearly spherical, is nourished and attains perfection in the ovary of its parent. Pupa changes in the same situation, and is produced in the state in which it undergoes the final change; its structure is nearly as in the *Muscina*, excepting an evident indentation at the end, which becomes the lower extremity of the future imago. Imago, with triarticulate antennæ, the second joint most developed, and the third originating in a hollow or socket near the base of the second; mouth apparently adapted for suction, its component parts appear to be two mandibles, two maxillæ, and a sheath-like labium; tarsi five-jointed; occasionally with the fore-wings developed, and the hind-wings appearing as poisers. Infects quadrupeds and birds. *Hippobosca*, and the genera separated from it.

Natural Order.—Nycteribites.

Larva and pupa as in the preceding order. Imago, with the antennæ, obsolete; the mouth situated on the back of the prothorax, in which the head seems sunk; parts of the mouth obsolete or unascertained; wings entirely obsolete; legs, with the femora and tibiæ, each two-jointed, the tarsi five-jointed. Infests bats. *Nycteribia*. Authorities for these characters, Leach and Latreille; they are not written from actual investigation, and appear somewhat unsatisfactory.

Situation at present doubtful.

Natural Order.—Stylopites, *Bee-parasites*.

Larva apod, with a hard corneous head; inhabits the bodies of bees in the imago state, feeding on those parts not positively essential to life. Pupa changes in the same situation. Imago, when hatched, comes from between the segments of the body, generally between the protelum and paratelum; antennæ six-jointed, the joints variously developed in the genera; labrum distinct; mandibles linear and rigid; maxillæ less developed, each bearing an exarticulate feeler; labium triangular and pointed, bearing no

feeler; eyes large, hemispherical, granulated, and distant; ocelli none; head broader than long; prothorax very short; mesothorax very large; fore-wings ample, folded longitudinally; alulæ none; before these are two patagia or tippets, similar to those of *Lepidoptera*, being naked, pedunculate processes, which the insect can move rapidly at pleasure; hind-wings obsolete; tarsi five-jointed. (*Xenos.*) *Stylops*, *Elenchus*, *Halictophagus*.

Division II.—Tetraptera Necromorpha.

Larva bearing no resemblance to the imago. Pupa perfectly quiescent, having the organs of locomotion and manducation confined by a shell-like skin; yet displaying all the limbs and organs, placed in order by the sides of the body, and detached from it, except at the usual points of connexion.

Class III.—Hymenoptera.

Larva with small corneous mandibles, moving horizontally; in one stirps, with six articulate, and twelve to sixteen prehensile, feet; in the remaining stirps, without feet. Feeds on a composition provided by the imago (Stirps I. and III.); the putrefying bodies of other insects (Stirps II.); honey and pollen (Stirps IV.); the fleshy parts of living insects (Stirps V.); the wood of dead trees (Stirps VI.); or the leaves of living vegetables (Stirps VII.) Imago, with the mandibles strong, moving horizontally, and masticatory; the other organs of the mouth fully developed; three ocelli; wings all developed, the fore- exceeding the hind-wings in size, membranaceous, and used in flying; the mesothorax largely developed at the expense of the pro- and metathorax; the podeon mostly restricted; the tarsi five-jointed. Food very various.

Stirps.—Formicina, *Ants.*

Natural Order.—Formicites, *Social Ants.*

Larva an inactive, obese, voracious maggot, residing entirely in the earth, and dependant for food on the care of the perfect insects. Pupa changes in a tough leathery cocoon; these cocoons are commonly known as "ants' eggs." Imago, with the antennæ, composed of about thirteen joints, often elbowed, slightly incrassated exteriorly; mandibles somewhat triangular, toothed; maxillæ obtuse; labium short, obtuse, its ligula not produced;

maxillary and labial feelers fully developed and distinctly articulate; fore-wings ample; hind-wings small; lives underground in immense societies, consisting of three kinds of individuals, males, females, and abortive females; the latter differ from the two former in wanting wings, and in having the pro-, meso-, and metathorax of nearly uniform development. *Formica.* (*Polyergus*, *Odontomachus*, *Ponera*), *Myrmica*, (*Eciton*, *Atta*, *Cryptocerus*).

Natural Order.—Mutillites, *Solitary Ants.*

Larva and pupa unknown. Imago, with antennæ composed of about thirteen joints, not elbowed, rather attenuated exteriorly; mandibles long, dentate at the apex; maxillæ obtuse; labium short, obtuse, its ligula not produced; maxillary and labial feelers fully developed and distinctly articulate; ocelli indistinct or wanting; wings possessed by the males only; females usually with the pro-, meso-, and metathorax equally developed; abortive females none. Inhabits sandy situations, is solitary. (*Dorylus*, *Labidus*, *Apterogyna*, *Psammotherma*,) *Mutilla*, *Myrmosa*, (*Myrmecoda*, *Scleroderma*,) *Methoca*. This and the preceding order require subdivision.

Stirps. — Sphecina, *Sand-wasps.*

Natural Order.—Scoliites.

Larva an elongate inactive maggot; inhabits a burrow or hole made in the sand by its parent, and feeds on the larvæ or imagines of other insects which she has provided for its sustenance. Pupa changes in a silken cocoon spun by the larva at the bottom of its domicile. Imago, with antennæ composed of about thirteen joints, very short, recurved, almost forming a ring; mandibles short, strong, dentate; maxillæ long, their feelers also long; labium longer than in the *Formicina;* its ligula trilobed; ocelli three, distinct; wings alike in both sexes; legs short, stout, spiny; female with a pungent sting. Solitary; inhabits sandy districts, settling occasionally on umbellate flowers; feeds on insects. *Tiphia*, (*Myzina*, *Meria*, *Scholia.*)

Natural Order.—Sapygites.

Larva and pupa supposed to be as in the preceding order. Imago, with antennæ composed of about thirteen joints, exteriorly incrassated, particularly in the males, longer and more robust than in the preceding order; mandibles, labium, &c. nearly as in the

Scholiites; ocelli three, distinct; wings alike in both sexes; legs short but slender, and without spines; female with a sting. Solitary; female inhabits walls, palings, and posts; male settles on umbellate flowers. (*Thynnus*, *Polochrum*), *Sapyga*.

NATURAL ORDER.—POMPILITES.

Larva and pupa as in *Scholiites*, the food of the former consisting frequently of spiders provided by its parent. Imago, with antennæ composed of about thirteen joints, more long and slender than in the two preceding orders, attenuated exteriorly, and mostly recurved; mandibles long, dentate at the apex; labium short, with its ligula short and trilobed; ocelli three, distinct; wings alike in both sexes; legs long, spiny; female armed with a sting; inhabits all sunny banks in sandy situations, running with great activity, and continually vibrating its antennæ and wings; feeds on insects. *Ceropales*, *Pompilus*, (*Planiceps.*) *Aporus*.

NATURAL ORDER.—SPHECITES.

Larva and pupa as in *Scholiites*, the food differing only in the kind of insect provided. Imago, with the antennæ composed of thirteen joints, short and recurved in both sexes; mandibles very long, acute; maxillæ very long, obtuse at the apex of their lacinia; labium, with its ligula, elongate, bifid, and flexible; ocelli three; podeon elongate and very slender, whereas in the three preceding orders it is very short; legs long. Inhabits sandy situations, flying heavily, but running with agility, and feeding on insects. (*Dolichurus*, *Pelopœus*,) *Ammophila*, (*Sphex*).

NATURAL ORDER.—LARRITES.

Larva and pupa as in the *Scholiites*, the former frequently feeding on *Cimicites*, provided for it by its parent. Imago, with antennæ composed of thirteen joints, shorter in the females than the males, and often incrassated exteriorly; mandibles less elongate than in the *Sphecites*, and bifid at the apex; maxillæ very obtuse; labium short, its ligula short, obtuse, and bilobed; ocelli three; podeon generally short and indistinct; legs moderately long. Inhabits sandy situations, occasionally umbellate flowers; is fond of settling on stones, leaves, &c.; feeds on insects. *Gorytes*, *Psen*, *Larra*, *Lyrops*, *Dinetus*, *Trypoxylon*, *Oxybelus*.

(NATURAL ORDER.—BEMBECITES.

Larva and pupa as in the *Scholiites*, the food provided for the larva consisting of *Syrphina* and *Muscina*. Imago, with

antennæ thirteen-jointed, elbowed at the second, short, and of nearly uniform substance; &c. &c. *Bembex*, *Monedula*.)

NATURAL ORDER.—CRABRONITES.

Larva and pupa as in the *Scholiites*, excepting that in this order many are frequently found in the same burrow. Imago, with antennæ thirteen-jointed, short, and slightly incrassated externally; mandibles long, acute, and terminating in a single point; maxillæ obtuse; labium elongate, its ligula short, dilated, obtuse, and terminating in four lobes; ocelli three; head very large, square; legs short and stout, fore-legs often patellated; body, with its greatest diameter, about the ninth segment, very glabrous, black, or black and yellow. Inhabits sandy banks, settling on leaves, stones, and umbellate flowers. *Cerceris*, *Philanthus*, *Crabro*, *Rhapalum*, *Stigmus*.

STIRPS.—VESPINA, *Wasps*.

NATURAL ORDER.—VESPITES.

Larva an obese inactive maggot, inhabiting a cell provided by its parent, who supplies it with food, consisting of honey, pollen, &c. Pupa changes in a silken cocoon, which the larva spins in its cell. Imago, with antennæ composed of twelve joints in the female, thirteen in the male, slightly elbowed at the second joint; eyes somewhat reniform, the indented portions facing each other; ocelli three; upper-wings folded longitudinally; podeon slender, but short; eighth segment largest, both as to length and breadth. Live commonly in societies composed of three kinds of individuals, males, females, and abortive females; the two last are furnished with stings: inhabit all climates and all situations, devouring almost every article capable of affording nutriment, but particularly fond of sugar, fruits, the flesh of animals and living insects. *Vespa*, *Eumenes*, *Odynerus*, *Epipone*.

(NATURAL ORDER.—MASARITES.

Larva and pupa as in the *Vespites*. Imago, with the antennæ composed of thirteen joints, of which the five terminal ones are closely united and form a club; wings as in the *Vespites*, &c. *Masaris*, *Chelonites*.)

STIRPS.—APINA, *Bees*.

NATURAL ORDER.—OSMIITES.

Larva an obese inactive maggot, deposited as an egg in the midst of a semi-fluid substance, composed of honey and pollen, collected

by its parent, and stored in cells which are constructed for the purpose, mostly in timber which is going to decay; these cells are sometimes crowded together without order, but mostly regularly following each other in a cylindrical tube, composed of wax, leaves, mortar, and a variety of substances; this cylindrical tube being constructed in, and closely fitted to, a perforation made in the timber for the purpose, as the perforation passes completely through the substance of the timber, the larvæ which are first deposited, and consequently first become pupæ and perfect insects, escape one after another without disturbing those above them. Imago, with antennæ thirteen-jointed in the female, fourteen-jointed in the male; they are slightly elbowed at the second joint, which is much longer than the others; the blade of the maxillæ is elongate and somewhat falcate; the maxillary feelers are minute, and generally composed of six indistinct joints; the labium has its ligula variously developed; it is always trilobed, but the central lobe, though always elongate, varies in the proportion it bears to the labial feelers; the lateral lobes are very minute, short, and acute; the labial feelers have the basal joint long, the second longer, the third and fourth short, somewhat conical, and forming an angle with the second; the hind-tibiæ are not formed for collecting pollen, but the body of the female is clothed beneath with a thick covering of hair, which serves for this use. *Anthidium*, *Megachile*, *Osmia*, *Heriades*, *Chelostoma*, *Ceratina?*

Natural Order.—Panurgites.

Larva and pupa, as far as the British genera are concerned, unknown. Imago, with antennæ thirteen-jointed in the females, fourteen-jointed, and somewhat moniliform, in the males; maxillæ with the blade lanceolate and of moderate length; the maxillary feelers of equal length, and six-jointed; labium, with the ligula trilobed, the central lobe about equal to the true lip in length, the lateral lobes very short and acute; the labial feelers with four joints, varying but slightly in length from each other; the feelers exceed the ligula in length; wings large, flight slow; insect inactive; economy unknown; body rather stout; black, hairy. Inhabits in immense abundance the flowers of *Leontodon*, *Hieracium*, and other similar composite plants, in August and September. *Panurgus*. (*Systropha*, *Xyocopa*,) &c. are closely allied; the latter insect's economy nearly approaches that of *Ceratina* in the preceding order.

Natural Order.—Andrenites.

Larva inhabits a long tortuous burrow, formed by its parent in the ground; a small heap of earth, produced in excavating which, may almost invariably be observed at the mouth of the burrow; feeds on a globular pellet of pollen, collected, moistened, and kneaded into a consistent mass, by the parent. Pupa changes in the earth. Imago, with antennæ thirteen-jointed in the female, fourteen-jointed, and of much greater length, in the male, elbowed, particularly in the females, at the second joint; maxillæ with the blade somewhat obtuse, and no longer than the maxillary feeler, which is distinctly six-jointed; labium, with the ligula very short, and quadrilobed, the lateral lobes usually equalling the internal ones in length; hind-tibiæ formed for collecting pollen. Inhabits sunny banks, and flies incessantly about hedges and evergreens in the spring; is gregarious, but each pair has its proper nest. Two kinds of individuals only. *Colletes*, *Dasypoda*, *Andrena*, *Halictus*, *Sphecodes*.

Natural Order.—Melliturgites.

Larva inhabits nests constructed by its parent, either in the ground or against a bank or wall, and consumes pollen provided by its parent, and stored up at the time the egg is deposited. Pupa changes in a silken cocoon in the same situation. Imago, with antennæ thirteen-jointed in the female, fourteen-jointed in the male, elbowed at the second joint; maxillæ, with the blade lanceolate, elongate; the maxillary feelers six-jointed and setaceous; labium, with its ligula, trilobed, central lobe very long, obtuse, pubescent, lateral lobes not more than a fourth of its length, very acute; ligula, labial feelers, and blade of maxillæ, nearly corresponding in length; hind-tibiæ formed for collecting pollen; body short, robust; wings small; economy not social. Two kinds of individuals only, both of which labour in the construction of the nests. *Saropoda*, *Anthophora*.

Natural Order.—Apites, *Social Bees*.

Larva inhabits a cell usually hexagonal, and made of wax by the imago; it is fed with honey or a preparation of pollen by the imago. Pupa changes in a silken cocoon within the cell. Imago, with the antennæ thirteen-jointed in the female, fourteen-jointed in the male, elbowed at the second joint; labium, with its ligula trilobed, the central lobe elongate, hirsute, extending beyond the labial feelers, the lateral lobes very short and obtuse; the labial

feelers with the basal joint twice the length of the second, the third and fourth minute, short, and seated on the back of the second, rather before its extremity; blade of the maxillæ lanceolate, nearly as long as the labial feelers; maxillary feelers minute, apparently exarticulate; hind-tibiæ with brushes for collecting farina. Live in large societies, composed of three kinds of individuals, males, females, and abortive females; the latter perform the laborious offices of the commonwealth. *Apis*, the honey-bee; *Bombus*, the humble-bee.

Natural Order.—Apathites, *Cuckoo-bees.*

Larva hatched from an egg, deposited by its parent in the nests of all the preceding *Apina* at the time when their own eggs are laid; when it hatches, being stronger and larger than the rightful possessor of the cell, it consumes the food provided for its companion, and starves it to death; and in those instances in which fresh supplies of food are daily provided, it continues to receive and appropriate them as its own. Pupa changes in the same situation, in a silken cocoon, spun by the larva. Imago has no apparatus either on the body or legs for collecting honey; in other respects it resembles in structure each of the orders of *Apina* before described; it enters their nest with perfect familiarity, and seems to be quite unsuspected of intrusion; it collects no pollen or honey, never builds a nest of any kind or takes any care of its young, but spends its time among flowers, or hovering about sand-banks in which other bees have fixed their habitations. *Apathus*,[k] *Cœlioxys*, *Melecta*, *Stelis? Epeolus*, *Nomada*, *Hylæus?*

Natural Order.—Chrysidites.

Larva and pupa, as in the *Apathites*, prey on the food destined for other insects, particularly of the two preceding Stirpes. Imago, with the antennæ thirteen-jointed in both sexes, the second joint elongated, and forming a slight elbow; maxillæ obtuse, dilated, their palpi five-jointed; labium, with the ligula obtuse, entire; labial palpi three-jointed; ocelli three; body convex above, flattened or sometimes concave beneath, furnished, in the females, with a tubular retractile oviduct, but without a sting; colours excessively brilliant, red, green, and blue, with a metallic

[k] *Apathus.* The genus *Psithyrus* of Dalbom. It closely resembles *Bombus*, except in the want of the hirsuties on the hind legs for collecting pollen. In both of our lists of British insects the species of this genus are scattered throughout the genus *Bombus:* the same is the case in Kirby's "Monographia Apum Angliæ." *Psithyrus* is a genus of *Sphingites.*—A, *absque*, παθος, *affectio.*

gloss; abundant in fine sunshiny weather, settling on walls, sand-banks, posts, railings, &c. running with activity, and a vibrating motion of the antennæ. (*Parnopes*, *Stilbum*, *Euchrœus*,) *Hedychrum*, *Elampus*, *Chrysis*, *Cleptes*.

Stirps.—Ichneumonina, *Parasites.*

Natural Order.—Proctotrupites.

Larva inhabits and feeds on the larvæ of other insects. Pupa changes in the same situations. Imago, with antennæ composed of ten to fifteen joints, elongate in the males, shorter and often clavated in the females; mandibles somewhat elongate, their extremity generally bifid; maxillæ with the blade dilated, rounded, feelers generally three-jointed; labium, with its ligula seldom produced, entire, feelers minute, often exarticulate; ocelli three; fore-wings with a single principal nervure; hind-wings without nervures; oviduct of the female tubular and retractile, being simply an elongation of the body. Inhabits grass under trees, &c. during the greater part of the year. *Cinetus*, *Psilus*, *Proctotrupes*, *Platygaster*, *Teleas*, *Ceraphron*, *Sparasion*, *Dryinus*, *Helorus?*

Natural Order.—Mymarites.

Larva inhabits and feeds on the eggs of Lepidopterous insects. Pupa changes within the shell of the egg. Imago, with the antennæ nine- to thirteen-jointed, sometimes twice the length of the body in the male, in the female elbowed and clavated; mandibles at the apex tridentate; the other organs of the mouth are obsolete or undiscovered; fore-wings pedunculated, with one short basal nervure, strongly ciliated; hind-wings the same, often a mere seta; legs long; podeon elongate, slender; ovipositor very slender, concealed beneath the body in a groove. Inhabits grass under trees. *Ooctonus*, *Litus*, *Anagrus*, *Polynema*, *Mymar*, *Eustochus*.

Natural Order.—Chalcites.

Larva inhabits and devours other insects in all stages, particularly the larvæ of *Lepidoptera* and *Diptera*. Pupa usually changes within the skin of its victim. Imago, with the antennæ generally composed of thirteen joints, the second long, forming an elbow, the remaining joints generally incrassated towards the apex; mandibles obtuse; maxillæ, with the blade rather produced, but obtuse; maxillary palpi four-jointed; labium, with its

ligula always produced, but short and entire; labial palpi three-jointed; ocelli three; head very large, square; fore-wings with a single nervure, often ciliated; hind with none; body often short and depressed in the males, more elongate and pointed in the females; oviduct of the female slender, mostly concealed; colour mostly brilliant. *Perilampus*, *Leucospis*, *Smiera*, *Chalcis*, *Callimome*, *Pteromalus*, *Encyrtus*, *Eulophus*, *Spalangia*, *Eucharis*.

Natural Order.—Cynipites.

Larva inhabits and causes the excrescences we observe on the trunks, twigs, leaves, &c. of trees, particularly the oak, and commonly known as "galls," feeding on the sap or substance. Pupa changes in the cavity made by the larva. Imago, with the antennæ composed of thirteen to fifteen joints, increasing in size exteriorly, but never clavated; mandibles obtuse; maxillæ dilated, obtuse, feelers often five-jointed; labium short, with its ligula produced, generally as long as the feelers, entire; feelers mostly three-jointed; wings with many nervures; head rather small, somewhat retiring; mesothorax large and convex; podeon short, very slender; body compressed; decatory in the female very large; ovipositor curved, or spirally convoluted beneath the body. Beaten out of trees, and off grass, in the summer. *Cynips*, *Figites*, *Ibalia*, *Anacharis*.

Natural Order.—Evaniites.

Larva inhabits the larvæ of *Sphecina*, and occasionally of *Blattina*. Pupa changes within the cocoon spun by the larva of the former of these Stirpes. Imago, with antennæ thirteen-jointed, of uniform thickness, and very straight; mandibles short, stout, acute, and bifid; maxillæ dilated and obtuse, feelers six-jointed; labium, with the ligula very short, quadrilobed, the lateral lobes very minute, feelers long, often robust, four-jointed; wings with many nervures; podeon slender. Found in summer, flying over flowers and about sand-banks, in which the *Sphecina* have formed their burrows and provided for their young. *Evania*, *Brachygaster*, *Fœnus*, (*Pelecinus? Stephenus?*) *Plancus*.

Natural Order.—Braconites.

Larva more obese, without distinct markings and divisions; feeds, often in company, on the larvæ of *Lepidoptera*, and other insects, while they are still living. Pupa changes within the skin of the Lepidopterous larva, or in small silken cocoons, attached to the

hair or body of its prey, or to the trees and leaves in the neighbourhood, from which it is occasionally seen suspended by a silken thread; more than thirty of these parasites sometimes feed within the body of a single caterpillar of the cabbage butterfly, which may be seen in numbers glued to palings, in the autumn, by these parasites, and surrounded by their little yellow cocoons, giving to the uninstructed the idea of a caterpillar sitting on its eggs. Imago, with the antennæ ten- to twenty-jointed; mandibles short, generally bifid; maxillæ obtuse, feelers six-jointed, elongate; labium short; ligula obtuse and entire; feelers four-jointed; ocelli three; fore-wings with fewer nervures than the following Order; hind-wings with still less; podeon slender and short; oviduct with two protecting appendages. Inhabits grass, shrubs, &c. throughout the summer; often flies in a vaulting company, like gnats in the sunshine; runs slowly. *Bassus*, *Rogas*, *Alysia*, *Bracon*, *Microgaster*, *Microdus*, *Sigalphus*, *Aphidius*.

Natural Order.—Ichneumonites.

Larva elongate, with the divisions of the segments clearly defined; an indentation frequently passes along the sides, above and below the middle portion, which thus becomes raised: solitary; inhabits and devours the fleshy parts of other insects, while they are themselves yet alive and performing their usual functions; during the whole of its parasitic career taking care to do no injury to those parts on which the life of its prey depends. Pupa changes sometimes within the shell of the pupa of the Lepidopterous insects; sometimes in the ground, in a tough, close, leathery cocoon, spun by the larva. Imago, with long filiform antennæ composed of about forty joints; mandibles short, stout, acute, and bifid; maxillæ dilated and obtuse, their feelers six-jointed, and often very long; labium short, its ligula short and bilobed, its feelers generally four-jointed; ocelli three; fore- and hind-wings with numerous nervures; podeon always slender, seldom or never elongate; oviduct generally defended by a setaceous appendage on each side, thus appearing to be triple: varies greatly in length. Inhabits vegetables of all kinds throughout the summer, the females busily engaged in searching after Lepidopterous larvæ in which to deposit their eggs; their wings and antennæ are continually in motion; the males frequent umbellate flowers, and feed on pollen; the females not unfrequently eat small insects and larvæ. *Ichneumon*, *Anomalon*, *Ophion*, *Banchus*, *Peltastes*, *Alomya*, *Cryptus*, *Pimpla*, *Xylonomus*.

Stirps.—Sirecina.

Natural Order.—Sirecites.

Larva hatched from eggs deposited in the wood of the fir-tree, sometimes two or three hundred in a cluster, cylindrical, with six rudimental articulate legs; head corneous; paratelum incrassated; gnaws the timber, making a bore, in which it lives, the exact size of its body. Pupa changes in the same situation. Imago, with antennæ filiform, attenuated exteriorly, composed of fifteen to thirty joints, the number varying in different individuals of the same sex and species; mandibles strong, trifid; maxillæ rather elongate, soft, flexible, obtuse, their feelers very minute, exarticulate; labium somewhat triangular; ligula short, entire, dilated; feelers three-jointed, the terminal joint long and incrassated; ocelli three; wings ample, with many strong nervures; prothorax fully developed, broader than the head, its anterior and posterior margins concave; the following segments fully and equally developed; ovipositor exserted, composed of three setæ. Inhabits fir-plantations. *Sirex*, (*Tremex.*)

Natural Order.—Xyphidriites.

Larva perfectly without feet. Inhabits and lives on the dead or dying wood of various trees. Pupa changes in the same situations. Imago, with antennæ composed of seventeen or eighteen joints, gradually attenuated towards the apex; mandibles small, with four distinct teeth; maxillæ short, obtuse, their feelers biarticulate; labium short; ligula, minute, entire; feelers four-jointed; ocelli three; head orbicular, large; prothorax very long, slender, and neck-like; the remaining segments of uniform size; the oviduct of the female exserted, covered above by a sheath-like appendage. Inhabits posts, decayed willows, &c. flying in the sunshine. *Xyphidria.*

Natural Order.—Xyelites.

Larva perfectly without feet. Feeds in the wood of fir-trees, making channels, as in the two preceding Orders. Pupa changes in the same situations. Imago, with antennæ twelve-jointed, the basal and second joint short, the third very long, and the nine following very short, together scarcely equalling the third in length, elbowed twice, at each end of the long joint; mandibles moderately long, acute, and dentate internally; maxillæ with the blade small, obtuse, the galea biarticulate, the feelers very long and four-jointed; labium short, ligula hitherto undiscovered,

feelers four-jointed; ocelli three; wings very ample; legs short; prothorax not developed superiorly, the mesothorax and head meeting above it; podeon as wide as the other segments; oviduct ensiform, exserted, enclosed between two appendages. Inhabits fir-trees, occasionally settling on umbelliferous plants. *Xyela.*

Natural Order.—Oryssites.

Larva and pupa unknown; the former is supposed to feed on the wood of dead fir-trees and old horn-beams. Imago, with antennæ eleven-jointed in the male, ten-jointed in the female, short, rather incrassated exteriorly, the joints of various proportions and forms; mandibles dilated, rounded, pubescent; maxillæ, with the blade, obtuse, rounded; the galea rather elongate, narrow, and truncate at the apex; feelers long, pubescent, and five-jointed; labium short, with the ligula small, rounded, and entire, and the feelers rather short and three-jointed; ocelli three; fore and hind wings moderately large, with numerous nervures; legs short; prothorax with very little development superiorly; podeon as wide as the other segments; ovipositor spirally convoluted beneath the body. Inhabits fir and horn-beam trees, running over them in the sunshine with great rapidity; the male has been found on umbellate flowers. *Oryssus.*

Stirps.—Tenthredinina, *Saw-flies.*

Natural Order.—Allantites.

Larva cylindrical, of uniform substance, with six articulated and twelve or fourteen membranaceous feet. Inhabits vegetables, feeding upon their leaves in the manner of *Lepidopterous* larvæ. Pupa sometimes changes in a cocoon, fixed in a curled leaf of the plant the larva feeds on, but most commonly on or in the ground. Imago, with antennæ nine-jointed, of uniform substance, or attenuated towards the apex; mandibles short, strong, very acute at the apex, and having one internal tooth; maxillæ, with the blade acute, the galea obtuse and exarticulate, the feelers long and six-jointed; labium short, with the ligula distinctly trilobed; wings ample, the disposition of their nervures afford characters for generic division; podeon equally developed with the other segments; oviduct with teeth like a saw. The species of this order are most abundant in the spring and summer in woods, gardens, and lanes, settling on leaves and flowers, flying with ease, but not far at a time, and being full of motion and activity in the sunshine. They feed apparently on the pollen of flowers.

Nematus, Cladius, Crœsus, Emphytus, Dolerus, Dosytheus, Allantus, Fenusa, Selandria, Athalia.

Natural Order.—Hylotomites.

Larva cylindrical, rather attenuated towards the extremities, with six articulated and fourteen membranaceous legs. Inhabits and feeds on the leaves of vegetables; changes its colour with every change of skin, a peculiarity to which some of the *Allantites* are also subject, Pupa changes mostly on the surface of the ground. Imago, with the antennæ three-jointed; the basal and second joints very short, the third very long, ciliated, and often double, or having two shafts in the manner of a fork; mandibles corneous, acute, with a small internal tooth; maxillæ with the blade acute, the galea robust and obtuse, the feeler long and six-jointed; labium short, with the ligula small, but distinctly trilobed; feelers four-jointed; ocelli three; body, with the segments and oviduct, as in the *Allantites*. Settles and feeds on umbellate flowers. *Schizocerus, Hylotoma.*

Natural Order.—Tenthredinites.

Larva mostly chagreened, cylindrical, with six articulate and twelve prehensile legs. Feeds on the leaves of trees. Pupa changes in a case composed of a glutinous matter, which becomes very hard when exposed to the air; the case is attached to a slender twig of the plant on which the larva feeds; in this case the larva remains unchanged during the months of autumn, winter, and spring. Imago, with antennæ seven-jointed, of which the third joint is always elongate, and the apical ones always form a club; the mandibles are longer than in the preceding order, acute at the apex, and internally bidentate; maxillæ, with the lacinia, obtuse and hirsute, the galea rather obtuse and distinctly articulate, and the feelers long and six-jointed; labium short, with the ligula distinctly trilobed, the feelers four-jointed; ocelli three; segments of the body fully developed; oviduct as in the *Allantites*. Inhabits flowers and leaves; flies in the sunshine. *Abia, Zarœa, Cimbex, Trichissoma, Clavellaria.*

Natural Order.—Lydites.

Larva smooth, cylindrical, with six short, articulate, and no prehensile legs. Feeds on the leaves of trees, inhabiting a web of its own making. Pupa changes in a silken cocoon on the stem of the trees it inhabits, or on the ground. Imago, with the antennæ composed of seventeen to thirty segments, filiform, and attenuated

exteriorly; mandibles long, acute at the apex, and having one tooth internally; maxillæ, with the blade and galea, obtuse, the feeler long and six-jointed; labium short, ligula more produced, trilobed; ocelli three; head large, orbicular; wings ample, with numerous nervures; legs short; podeon fully developed; body short and robust. Inhabits woods, flying in the sun, settling on leaves, and occasionally, but rarely, on flowers. *Tarpa*, *Lyda*, *Lophyrus ?* which principally differs in its pectinated antennæ.

Natural Order.—Cephites.

Larva elongate, with its feet obsolete or rudimental. Inhabits and feeds on the stalks of corn and the buds of fruit-trees. Pupa changes within the stalk. Imago, with antennæ twenty-jointed, long, filiform, slightly incrassated externally; mandibles short, broad, trifid; maxillæ with the blade distinct and acute, the galea elongate, and separated from the maxilla by a distinct line, resembling an anchylosed articulation, the feeler long and six-jointed; labium, with its four parts, perfectly developed, the feeler-bearer elongate, and notched at the apex, the ligula produced and trilobed, and the feeler four-jointed; ocelli three; head rather square, broader than the following segments; prothorax fully developed, cylindrical, quite detached from the mesothorax; podeon fully developed, divided on the back longitudinally; body elongate; legs elongate; flight easy and graceful in the sunshine. Settles in abundance on composite flowers by the road-side, and in meadows on *Ranunculi*. *Cephus*.

Class IV.—Coleoptera.

Larva, with corneous mandibles moving horizontally; a pair of articulate feet, generally on the second, third, and fourth segment; no other feet, unless a prehensile caudal appendage occasionally present can be so denominated. Food very various. Pupa of nearly uniform appearance. Imago, with the parts of the mouth fully developed; the mandibles moving horizontally, and being employed in mastication. Wings fully developed; fore-wings hard, crustaceous, not used in flying, when closed meeting with parallel edges, and completely covering the hind-wings, to protect which appears their only office; hind-wings generally much longer than the body, folded longitudinally and transversely beneath the fore-wings. Prothorax very large; mesothorax small; metathorax large. Food various.

Stirps.—Blapsina.

Natural Order.—Blapsites, *Slow-legged-beetles.*

Larva elongate, cylindrical, with six articulate and one caudal leg. Lives in the dark, feeding on decayed animal and vegetable substances. Pupa changes in the same situations. Imago, with moniliform antennæ, the third joint being the longest; mandibles small but strong, bifid at the apex; maxillæ with a single tooth internally; wings, particularly the hind pair, frequently wanting. Inhabits cellars, out-houses, decayed trees, shunning the light, and moving by night with a slow, awkward, and disgusting gait; of uniform dark brown or black colour. (*Pimelia*), *Blaps, Tenebrio.*

Natural Order.—Helopites.

Larva very elongate, cylindrical, frequently with two hooks on the telum. Inhabits and feeds on decayed wood. Pupa changes in the same situations. Imago, with filiform antennæ; mandibles sometimes bifid, sometimes terminating in a single point; maxillæ without the internal tooth; fore-wings generally soft and flexible, hind-wings generally perfect, adapted for flight. Inhabits decayed woods, flowers, &c. *Helops, Cistela, Melandrya, Conopalpus, Hypulus, Nothus, Ædemera ?*

Natural Order.—Mordellites.

Larva less elongate, soft, and more fleshy; legs less distinct. Inhabit and feed on decaying wood, flowers, and sometimes parasitical in the nests of wasps. Pupa changes in the same situations. Imago, with pectinated antennæ, particularly the males; head somewhat heart-shaped, and united vertically to the prothorax; fore-wings flexible, wide at the base, narrow at the apex; hind-wings mostly without the longitudinal fold. Inhabit flowers; diurnal, fly and run with rapidity and ease. *Mordella, Anaspis, Ripiphorus.*

Natural Order.—Pyrochroites, *Soldier-beetles.*

Larva more depressed; head as wide as the prothorax; paratelum the largest segment; telum corneous, and produced into two spines. Inhabits and feeds on decaying wood. Pupa changes in the same situations or in the ground. Imago, with long pectinated antennæ; head exserted, triangular, and porrected, horizontally narrower than the prothorax; fore-wings soft, flexible, brilliant red; diurnal, flying readily in the sunshine. *Pyrochroa.*

NATURAL ORDER.—CANTHARITES, *Blister-beetles, &c.*

Larva and pupa unknown, supposed in some instances to be parasitical. Imago, with moniliform antennæ incrassated about the middle; head larger than the prothorax, to which it is attached vertically; fore-wings short, their margins crossing each other, flexible; hind-wings often wanting; tarsi with the terminal claws double. *Meloë, Cantharis.*

NATURAL ORDER.—ANTHICITES, *Flower-beetles.*

Larva and pupa in decayed wood. Imago, with filiform antennæ sometimes slightly serrated; elongate linear body; soft fore-wings. Inhabits flowers, flying readily and in the day-time. *Notoxus, Anthicus, Xylophilus.*

STIRPS.—BUPRESTINA.

NATURAL ORDER.—PTINITES, *Wood-boring-beetles.*

Larva, with the articulate feet distinct, incrassated in the middle, narrower towards the tail, often covered with bristles. Commonly inhabits dry wood, through which it bores in all directions, reducing it to a powder. Pupa changes in the galleries made by the larva. Imago, with long antennæ generally filiform, but in some of the males highly pectinated; the mandibles strong and toothed; the head retractile within the prothorax; the prothorax more or less spherical; the fore-wings completely covering the body, and having often an inflated appearance. Inhabits the habitations of the larva, and occasionally flowers. *Ptilinus, Ptinus, Anobium, Mezium, Gibbium.*

NATURAL ORDER.—CLERITES.

Larva in structure like the preceding order, but more elongate, and less commonly hairy. Feeds on the larvæ of the preceding order, and occasionally of some *Hymenoptera*. Imago, with the antennæ incrassated externally; the mandibles bifid; the maxillæ obtuse; the prothorax is long, slender, cylindrical, of less circumference than the head or body. *Necrobia, Clerus, Opilus, Thanasimus, Tillus.*

NATURAL ORDER.—MELYRITES.

Larva and pupa unknown. Imago, with the antennæ filiform, tapering to the extremity; mandibles elongate, toothed, bifid at the apex; head nearly corresponding in width with the prothorax, but rather less; prothorax with the margins often dilated; when

touched, a red fleshy substance is protruded from several parts of the body and again withdrawn. Inhabits flowers; flies readily and in the sunshine. *Dasytes? Malachius.*

NATURAL ORDER.—LAMPYRITES, *Glow-worms.*

Larva composed of thirteen very distinct segments, the divisions between which are deeply marked, giving the back a serrated appearance; legs very perfect, the caudal leg also present. Inhabits old hedges among decayed sticks, found also under stones; feeds on minute snails, &c. Pupa changes under ground. Imago, with the antennæ filiform, moniliform, or pectinated; the mandibles small, soft, and somewhat imperfect; the prothorax flattened, dilated at the margins; the fore-wings flexible, leathery; females sometimes without wings; frequently emitting from the two last segments a bright phosphoric light. *Lampyris, Drilus, Telephorus, Lycus.*

NATURAL ORDER.—CEBRIONITES.

Larva and pupa unknown. Imago, with the antennæ very simple, (in the British genera) filiform; mandibles imperfect, terminating in a single point; prothorax semicircular, the convex, being the anterior margin, completely concealing the head; fore-wings and whole body soft and flexible, as though immature; more round and compact in shape than the preceding orders. Inhabits the leaves and flowers of plants in summer. *Dascillus, Elodes, Scirtes.*

NATURAL ORDER.—ELATERITES, *Click-beetles.*

Larva elongate, cylindrical, with six articulate and one caudal leg; slothful. Feeds on the roots of wheat, potatoes, &c., also occasionally in decaying timber; is very destructive to crops, and known to farmers as the WIRE-WORM. Pupa mostly changes in the ground. Imago, with moniliform antennæ, not unfrequently serrated or pectinated in the males; mandibles bifid at the extremity; head received into the prothorax; prothorax with a projecting spine beneath; metathorax with a cavity for the reception of the spine; by means of this instrument the insect, if laid on its back, leaps to a considerable height, with a loud clicking noise; diurnal, flies readily. Inhabits flowers, &c. *Elater, Campylus.*

NATURAL ORDER.—BUPRESTITES, *Burn-cows.*

Larva very elongate, cylindrical, with six articulate and one caudal prehensile leg. Feeds on timber. Pupa changes in the same situation. Imago, with serrated or pectinated antennæ; mandibles

short, strong, and bifid; head more than two-thirds received into the prothorax; prothorax beneath produced posteriorly into a spine; but there being no corresponding cavity in the mesothorax, the insect has not, when placed on its back, the power of leaping possessed by the *Elaterites*. These insects are diurnal; they possess the most gorgeous metallic colours; they run and fly with ease and rapidity. *Buprestis*.

STIRPS.—SCARABÆINA.

NATURAL ORDER.—CETONIITES, *Day-chafers*.

Larva, with six elongate, weak, articulate legs, and the posterior extremity of the body incrassated, soft, and recurved under the fore-part, which, touched, rolls in a ring, with the tail on one side of the head. Inhabits and feeds on decaying wood. Pupa changes in the same situations, or in the ground. Imago, with antennæ composed of ten joints, of which the three or four terminal ones are produced laterally, and form a club; labium membranaceous, most concealed by the clypeus; mandibles and maxillæ pubescent and membranaceous; colours various and brilliant; form generally flattened above; diurnal, flies with ease and rapidity. Feeds on the farina or honey of flowers. *Cetonia*, *Trichius*.

NATURAL ORDER.—MELOLONTHITES, *Cock-chafers*.

Larva resembles that of the preceding order. Inhabits the earth, feeding on the roots of vegetables. Pupa changes in the ground. Imago, with antennæ composed of nine or ten joints, the six or seven terminal ones produced laterally, and forming a flabellated club; labium more corneous than in the preceding order, and not entirely concealed by the clypeus; mandibles corneous and masticatory; colour less brilliant; form generally convex above; flight easy, not rapid; mostly nocturnal. Feeds on the leaves of vegetables. *Hoplia*, *Anomala*, *Melolontha*, *Amphimalla*, *Omaloplia*, *Phyllopertha*, *Serica*.

NATURAL ORDER.—TROGITES, *Sand-chafers*.

Larva resembles that of the two preceding orders. Feeds on decaying animal and vegetable matter found in sand, which it inhabits. Pupa changes in the sand. Imago, with antennæ composed of nine or ten joints, the three or four terminal ones forming a small round club; labium and mandibles concealed and membranaceous; colour black; form oval and very convex above. Inhabit sand, particularly by the sea-shore; seldom fly. *Trox*, *Ægialia*, *Psammodius*.

NATURAL ORDER.—SCARABÆITES, *Dung-chafers.*

Larva resembles the preceding. Inhabits and feeds on the excrement of animals. Pupa changes in the ground. Imago, with antennæ composed of nine or ten joints, the terminal one forming a compressed club; labium generally concealed by the clypeus; mandibles sometimes corneous, sometimes membranaceous; colour brown, black, or metallic-tinted black; form oval, convex above. Inhabit and feed as in the larva state; flight easy, rapid, mostly nocturnal. *Aphodius*, *Geotrupes*, *Bolboceras*, *Onthophagus*, *Copris.*

NATURAL ORDER.—LUCANITES, *Stag-beetles.*

Larva resembles the preceding; feeding on decayed wood. Pupa changes in the same situations. Imago, with ten-jointed antennæ, the basal joint very long, and the others bending forward from it at a right angle, forming an elbow, the three apical joints forming a club; labrum concealed or obsolete; mandibles very long, strong, and toothed; maxillæ weak and pilose. Flight nocturnal. Feed on the sap of plants. *Sinodendron*, *Lucanus*, *Platycerus.*

NATURAL ORDER.—HISTERITES, *Mimick-beetles.*

Larva rather more elongate than that of the *Lucanites*, in other respects nearly similar in formation. Inhabits and feeds on putrid substances. Pupa mostly changes in the ground. Imago, with clavate antennæ; strong corneous and projecting mandibles; head retractile within the prothorax; fore-wings square and very short; legs contractile; form a long square; covering excessively hard, highly polished. Inhabits putrid substances; mimics death when disturbed; flies occasionally in the sunshine. *Hister*, *Dendrophilus*, *Onthophilus*, *Abræus.*

NATURAL ORDER.—BYRRHITES, *Pill-beetles.*

Larva as in the *Histerites*, but somewhat pilose. Feeds on the roots of vegetables and decaying wood. Pupa mostly changes in the earth. Imago, with moniliform antennæ incrassated towards the extremity, but not clubbed; mandibles corneous but not projecting; form nearly globular; covering downy, not polished; head and legs contractile. Inhabits vegetables, mimicking death if touched; crawls in the day; flies but seldom. *Nosodendron*, *Byrrhus*, *Aspidiphorus*, *Simplocaria.*

STIRPS.—SILPHINA.

NATURAL ORDER.—DERMESTITES.

Larva somewhat shuttle-shaped, very pilose. Inhabits and feeds on decayed and dried animal substances. Pupa changes in the

same substances. Imago, with short clavated antennæ; mandibles short, strong, and toothed; form oval; head and legs retractile, but less perfectly so than in the two preceding Orders. Inhabits dead animals; when shaken out or disturbed mimicking death: flight principally nocturnal. *Attagenus, Dermestes, Megatoma.*

Natural Order.—Ipsites.

Larva more elongate, slightly pubescent. Inhabits and feeds on the bark of trees or fungi. Pupa changes in the bark. Imago, with clavated antennæ, the club not abrupt, but generally formed by a gradual incrassation of the antennæ externally; prothorax nearly square, generally longer than wide; form elongate: flight only occasional, mostly diurnal. *Lyctus, Sylvanus, Rhizophagus, Nemosoma, Ips, Tetratoma, Triplax, Mycetophagus, Antherophagus.*

Natural Order.—Nitidulites.

Larva pubescent, more active than the preceding. Generally inhabits and feeds on decayed animal substances. Pupa changes in the same situations or in the earth. Imago, with clavated antennæ, the club abrupt and well defined, usually composed of three joints: active; fly readily. Inhabits, in great quantities, decayed animal substances, particularly bones, and also strongly-scented flowers. *Catheretes, Meligethes, Strongylus, Nitidula, Thymalus.*

Natural Order.—Silphites, *Carrion-beetles.*

Larva glabrous, depressed, attenuated posteriorly; very active. Inhabits putrefying animal substances. Pupa changes mostly in the earth. Imago, with antennæ clavated, or moniliform, externally incrassated; mandibles strong, pointed, and prominent; head capable of being bent vertically, and concealed by the prothorax, but not withdrawn into it; prothorax as wide as the body. Inhabits putrid animal substances, as dead birds, mice, rats, &c. which it buries in the earth as receptacles for its eggs; flight diurnal and nocturnal; scent very offensive. *Silpha, Necrophorus, Choleva, Catops, Ptomaphagus, Scaphidium, Scaphiosoma.*

Natural Order.—Spheridiites, *Globe-beetles.*

Larva inhabits and feeds on the dung of horses and cows. Pupa changes in the same situations. Imago, with antennæ clavated; club distinct and abrupt; form nearly spherical or oval. Inhabits

and feeds as in the larva state; runs and flies with rapidity in the sunshine. *Sphæridium*, *Cercyon*. *Anisotomidæ?*

NATURAL ORDER.—HYDROPHILITES, *Herbivorous Water-beetles.*

Larva elongate, attenuated posteriorly, active, carnivorous, aquatic; head large, with long curved mandibles. Pupa changes in the earth or under dung. Imago, with clavated antennæ; mandibles strong and obtusely toothed; maxillary feelers very strong, and used in the water as antennæ; the form oval, the sides and back very convex, the surface glabrous. Inhabits water, swimming with ease, the feet being moved alternately; female covers her eggs with silk, forming a kind of cocoon, which she carries about with her in the manner of some spiders. Feeds on the decaying leaves of water-plants. *Spercheus*, *Hydrophilus*, *Hydroüs*, *Hydrobius*, *Berosus*.

NATURAL ORDER.—HELOPHORITES, *Diving-bell-beetles.*

Larva less elongate; sluggish; margins of the segments fringed with hair. Inhabits duckweed, and other plants on the surface and banks of ponds, also the surface of stones, mud, &c. Pupa changes sometimes in the same situations, but mostly in the earth. Imago, with antennæ more or less clavated, short, and generally concealed; the maxillary feelers being employed as antennæ; form elongate. Inhabits the banks of ponds and rivers, among aquatic plants, on which it feeds; enclosed in a bubble of air, it crawls on water-plants and on the surface of water, with the back downwards, but does not swim. *Hydræna*, *Helophorus*, *Hydrochus*, *Georyssus*, *Elmis*, *Parnus*, *Heterocerus*.

STIRPS V.—CARABINA.

NATURAL ORDER.—GYRINITES, *Water-fleas.*

Larva, with strong arcuate mandibles; a long fleshy process, fringed with hair, rising from both sides of each segment; carnivorous, aquatic, natatory. Pupa changes at the edge of ponds. Imago, with short clavated antennæ; mandibles short and obtuse, but strong; maxillæ somewhat obtuse; galea palpiform, exarticulate; fore-legs long, middle and hind-legs short and incrassated; carnivorous. Inhabits water, performing in the sunshine its beautiful and social gyrations on the surface. *Gyrinus*.

NATURAL ORDER.—DYTISCITES, *Carnivorous Water-beetles.*

Larva, with strong arcuate mandibles, perforated at the extremity for suction; carnivorous, aquatic, natatory. Pupa changes in the

earth, at the margins of ponds, among roots of trees and grass. Imago, with filiform antennæ; mandibles short and strong; maxillæ arcuate and very acute; galea palpiform and articulate; the fore-tarsi patellated in the males; the middle and hind-legs flattened and ciliated; form oval. Inhabits water, feeding on aquatic animals; swims with great ease and swiftness, moving the corresponding legs simultaneously. *Acilius, Dytiscus, Colymbetes, Noterus, Hydroporus, Haliplus?*

NATURAL ORDER.—CARABITES, *Ground-beetles.*

Larva with strong arcuate mandibles; active and carnivorous. Inhabits roots of grass, rubbish-heaps, decaying vegetables, moss, under stones, &c. in which situations it pursues and seizes its prey. Pupa changes in the earth. Imago, with moniliform antennæ; mandibles moderately short, very strong; maxillæ terminate in a blade, sometimes acute, but never articulated; galea articulate and palpiform. Universally distributed, running on the ground in pursuit of prey; chiefly nocturnal, and during the day found principally under stones and timber, at the roots of grass, in the sand of gravel-pits, &c.; sometimes flies, but not to avoid pursuit. *Elaphrus, Bembidium, Harpalus, Carabus, Dyschirius, Brachinus, Dromius, Odocantha, Drypta.*

NATURAL ORDER.—CICINDELITES, *Tiger-beetles.*

Larva with strong arcuate mandibles, and frequently with two remarkable recurved hooks on its back; it is carnivorous, and lies in wait for its prey in holes or dens, which it constructs in loose earth or sand, in sunny places. Pupa changes in the holes of the larva. Imago, with strong, long, arcuate, and deeply-toothed mandibles, which cross each other at about half their length; blade of the maxillæ acute and articulated; galea palpiform and articulated; legs very long and slender: diurnal, carnivorous, of light and elegant form; brilliant colours. Runs with amazing activity; flies to avoid pursuit. *Cicindela.*

NATURAL ORDER.—STAPHILINITES, *Devil's Coach-horses.*

Larva with strong mandibles; active, mostly carnivorous. Found under stones, at the roots of grass, and in rubbish-heaps, &c. Pupa changes in the same situations. Is remarkable for the compactness with which the limbs are attached, giving it the appearance of the *Amorpha adermata.* Imago, with moniliform antennæ; strong and acute mandibles; obtuse maxillæ; rounded and never palpiform galea. These beetles are distinguished at

once from all others by their square, short fore-wings, naked body, elongate form, and disgusting manner of turning up the tail like a scorpion. Inhabits and devours all putrefying substances, also living insects. *Staphylinus.*

Natural Order.—Pselaphites.

Larva and pupa unknown. Imago, with acute dentate mandibles; obtuse maxillæ; rounded, exarticulate, though somewhat palpiform galea; maxillary feelers, clavated, immensely developed, often equalling the antennæ in size; antennæ with ten or eleven joints, the last joint incrassated, forming a club; fore-wings quadrate and abbreviated; hind-wings usually wanting; tarsi two-jointed. Very minute; slow in its movements. Inhabits moss and the roots of grass, feeding on the *Acari* which occur in those situations. *Pselaphus.*

Natural Order.—Scydmænites.

Larva and pupa unknown. Imago, with antennæ eleven-jointed, moniliform, incrassated exteriorly; the basal joint rather long, the apical one ovate, which, with the two preceding, is incrassated; maxillary feelers very large, the third joint stout and conical, the fourth and terminal one small, acute; fore-wings completely cover the body; the tarsi five-jointed. Inhabit moss, and under planks near cucumber frames; feed on *Acari*. (*Mastigus*), *Scydmænus*, *Eutheia.*

Stirps VI.—Chrysomelina.

Natural Order.—Endomycites, *Fungus-beetles.*

Larva, with six distinct articulate legs; head small; middle of the body stout, gradually attenuated to the tail. Principally inhabits and feeds on the interior of fungi. Pupa changes in the same situations. Imago, with moniliform antennæ, incrassated externally; acute mandibles; tarsi three-jointed; form very convex, oval, glabrous. Inhabits fungi. (*Dasycerus*), *Lycoperdina*, *Endomychus.*

Natural Order.—Coccinellites, *Lady-birds.*

Larva in structure like that of the preceding Order, but rather more elongate and active. Inhabits the leaves of vegetables, feeding on the *Aphites* which suck their sap. Pupa attaches itself by the tail to a leaf, and changes in that position. Imago, with short and rather clavate antennæ; acute mandibles; tarsi three-jointed; form very convex above, nearly hemispherical. Inhabits vege-

tables, feeding on the *Aphites* which infest them. *Cacicula, Chilochorus, Coccinella.*

NATURAL ORDER.—CASSIDITES, *Tortoise-beetles.*

Larva more obese and obtuse, spiny or radiated round the margin; the tail furnished with a remarkable forked appendage, on which the excrement accumulates, forming a kind of umbrella, which protects it in some degree from observation. Inhabits and feeds on vegetables. Pupa changes in the same situations. Imago, with moniliform antennæ; mandibles and maxillæ obtuse and minute; galea palpiform, exarticulate; head completely hidden by the prothorax, which, together with the fore-wings, form a complete covering, like the carapax of a tortoise; tarsi four-jointed; form nearly hemispherical. Inhabits vegetables, on which it feeds. *Cassida.*

NATURAL ORDER.—CHRYSOMELITES.

Larva still more obese, inactive; legs short. Feeds on the leaves of vegetables. Pupa sometimes attaches itself, and changes in the same situations, and sometimes in the earth. Imago, with moniliform antennæ, inserted far from each other; mandibles rather obtuse; maxillæ obtuse; galea palpiform, exarticulate; head nearly concealed by the prothorax; tarsi four-jointed; legs not formed for leaping; form very globose, inactive; flies seldom. Inhabits vegetables, on the leaves of which it feeds. When touched frequently emits a red fluid from the mouth. *Cryptocephalus, Clythra, Chrysomela.*

NATURAL ORDER.—HALTICITES, *Flea-beetles.*

Larva and pupa nearly as in the preceding Order; the former rather less obese. Imago, with much longer and more filiform antennæ, and inserted nearer together; more acute mandibles; maxillæ obtuse; galea palpiform and articulate; hind-legs incrassated, formed for leaping; form less globose. Inhabits and feeds on vegetables; its size is little larger than that of a flea, an insect which it emulates in the activity of its leaps; it is excessively injurious to crops, sometimes causing a total failure of turnips, rape, &c. *Haltica.*

NATURAL ORDER.—GALERUCITES.

Larva and pupa nearly as in the *Chrysomelites.* Imago, with long filiform antennæ, inserted much nearer to each other than in either of the two preceding Orders; mandibles acute; maxillæ

obtuse, with a distinctly articulate palpiform galea; legs of similar structure, not formed for leaping; form more elongate. Inhabits and feeds on vegetables; flies more readily than the two preceding Orders, but does not leap. *Galeruca*, *Adimonia*, *Auchenia*, *Laperus*.

Natural Order.—Criocerites.

Larva more linear and elongate. Feeds on the leaves or within the stems of vegetables. Pupa generally changes in a silken cocoon, attached to the stems or roots of the vegetables on which it feeds. Imago, with moniliform antennæ, slightly incrassated externally, about as long as in the *Galerucites;* mandibles arcuate, bifid at the apex; maxillæ obtuse; galea incrassated, but not palpiform; prothorax proportionately much smaller than in any other Order of the Stirps; somewhat cylindrical; tarsi four-jointed; colours brilliant; flight only occasional, diurnal. Inhabits vegetables. *Crioceris*, *Donacia*.

Stirps VII.—Cerambycina.

Natural Order.—Lepturites.

Larva is almost entirely without feet, fleshy, linear; inhabits decaying timber. Pupa changes in the same situations. Imago, with filiform antennæ, usually about the length of the body, inserted between the eyes, but not interfering with their form; the head is elongated at its junction with the prothorax, somewhat in the manner of a neck; mandibles terminated generally in an acute point; maxillæ obtuse; galea obtuse, not palpiform; form elongate, attenuated posteriorly; tarsi four-jointed, diurnal. Inhabits flowers, apparently feeding on their farina. *Leptura*, *Pachyta*.

Natural Order.—Cerambicites, *Capricorn-beetles.*

Larva and pupa as in the preceding Order. Imago, with filiform antennæ, often much longer than the body, inserted close to the eyes, and partly surrounded by them; the eyes, consequently, become somewhat kidney-shaped, the head is not elongated at its junction, but is partly received into the prothorax; mandibles with an acute point; maxillæ and their galea obtuse; tarsi four-jointed; form elongate, nearly linear, slightly attenuated posteriorly: flight both diurnal and nocturnal. Inhabits the stems of trees, decayed wood, and sometimes flowers. *Molorchus*, *Clytus*, *Callidium*, *Cylindera*, *Obrium*, *Saperda*, *Lamia*, *Cerambyx*, *Prionus*.

NATURAL ORDER.—CUCUJITES, *Flat-bodied-beetles.*

Larva with six very short articulate legs; found in decayed timber. Pupa changes in the same situation. Imago, with filiform antennæ generally not longer than the prothorax; mandibles acute, porrected, and elongate, especially in the males; the maxillæ obtuse; galea pilose; head somewhat triangular, elongated posteriorly into a kind of neck; prothorax nearly square, very flat; body very flat; tarsi four-jointed. Inhabits timber. *Cucujus, Trogossita?* (*Parandra, Passandra.*)

NATURAL ORDER.—BOSTRICITES.

Larva a white maggot, completely without legs; inhabits and feeds on the bark or wood of trees, causing their death with unerring certainty. Pupa changes in the same situations. Imago, with clavated antennæ; mandibles generally bidentate; maxillæ, with their galea obtuse; the prothorax very convex, and usually as large as the remainder of the body; tarsi four-jointed; form cylindrical. Inhabit circular holes, which it bores in the bark and wood of trees, either to escape, after changing, from the pupa, or to deposit their eggs. *Cis, Bostrichus, Tomicus, Platypus, Hylesinus, Scolytus, Hylurgus.*

NATURAL ORDER.—CURCULIONITES, *Weevils.*

Larva without legs, and having occasionally in their place small mamillary processes; inhabits and feeds on the flowers, fruits, seeds, leaves, stalks, bark, wood, pith, and roots, of vegetables. Pupa changes in the same situations, sometimes naked, sometimes in a hard compact case, sometimes in a silken cocoon. Imago, with antennæ generally twelve-jointed, incrassated externally, the basal joint generally very long, the others bending forwards at a right angle, forming an elbow; these antennæ are placed on a long rostrum, which proceeds from between the eyes, and has the mouth at its extremity; mandibles generally obtuse; blade and galea of the maxillæ united and indistinct; tarsi four-jointed: mostly diurnal; feed on vegetables. *Curculio.*

NATURAL ORDER.—ANTHRIBITES.

Larva as in preceding, feeding on wood. Pupa changes in the channels made by the larva. Imago, with antennæ generally twelve-jointed, the basal joint not particularly elongate, therefore not elbowed, moniliform, incrassated externally, not situated on a

distinct rostrum, much elongated in the males; mandibles and maxillæ nearly as in the preceding Order; tarsi four-jointed. Inhabits the bark and wood of trees. *Brachytarsus*, *Platyrhinus*, *Anthribus*. *Bruchus* differs only in the superior size of its labrum, and in feeding on pulse.

Natural Order.—Salpingites.

Larva and pupa as in the preceding Orders; the former feeds on the wood and bark of trees. Imago, with antennæ shorter, moniliform, somewhat incrassated externally, and situated on a rostrum; mandibles and maxillæ obtuse; fore- and middle-tarsi five-jointed; hind-tarsi four-jointed. Found in the same situations as the larva, and also among the leaves of trees. *Salpingus*, *Sphæriestes*.

Division III.—Tetraptera Isomorpha.

Larva resembling the imago in structure, appearance, mode of feeding, &c. wings only being wanted. Pupa, or quiescent state, none.

Class IV.—Orthoptera.

Imago, with the parts of the mouth fully developed; labrum quadrate and movable; mandibles strong, bony, masticatory, and moving horizontally; maxillæ with feelers, and a distinct, exarticulate, palpiform galea; fore-wings coriaceous, little used in flight; hind-wings longitudinally folded; flight weak and badly sustained.

Stirps.—Forficulina.

Natural Order.—Forficulites, *Earwigs*.

The antennæ are many-jointed, moniliform, and decrease in size to the extremity; the fore-wings square, coriaceous, meeting with a straight suture, very short, and not used in flight; the hind-wings ear-shaped, folded, and projecting beyond the fore-wings; hind-legs not formed for leaping; tarsi three-jointed; telum furnished with two appendages which meet like forceps; nocturnal insects, feeding on vegetables. *Forficula*, *Labia*, *Labidura*.

Stirps.—Achetina.

Natural Order.—Achetites, *Crickets*.

Antennæ very long, slender, and composed of many joints; fore-wings short, coriaceous, one partially covering the other, not

used in flight; hind-wings folded longitudinally, and projecting beyond the fore-wings; hind-legs incrassated, formed for leaping; tarsi three-jointed: nocturnal, subterranean insects, feeding on vegetables. *Gryllotalpa*, *Acheta*.

STIRPS.—GRYLLINA.

NATURAL ORDER.—GRYLLITES, *Grasshoppers*.

Antennæ very long, slender, and composed of many joints; fore-wings coriaceous, as long as the hind-wings, which are folded longitudinally beneath them; hind-legs incrassated, formed for leaping; tarsi four-jointed; female furnished with an exserted oviduct: diurnal; feed on vegetables. *Gryllus*.

STIRPS.—LOCUSTINA.

NATURAL ORDER.—LOCUSTITES, *Locusts*.

Antennæ short, incrassated towards the middle or extremity, consisting of about ten joints; fore-wings coriaceous, generally as long as the hind-wings, which are folded longitudinally beneath them; hind-legs incrassated, formed for leaping; tarsi five-jointed; diurnal: feed on vegetables. *Locusta*, *Gomphocerus*, *Acrydium*.

(STIRPS.—SPECTRINA.

NATURAL ORDER.—SPECTRITES, *Spectres*.

Antennæ short, stout, composed of few joints; fore-wings coriaceous, small, short, often wanting, never covering the hind-wings, not used in flying; hind-wings folded longitudinally, often very large and beautifully coloured, sometimes wanting; legs alike in structure, not formed for leaping; tarsi five-jointed; prothorax short: diurnal; feed on leaves. *Spectrum Phasma*.)

(STIRPS.—MANTINA.

NATURAL ORDER.—MANTITES, *Walking-leaves*.

Antennæ long, filiform, very slender, and composed of many joints; fore-wings coriaceous, horizontal, generally covering the hind-wings, which are folded beneath them; fore-legs incrassated, and armed with teeth, longer than the middle- and hind-legs; tarsi five-jointed; prothorax long: diurnal; feed on other insects. *Mantis*.)

Stirps.—Blattina.

Natural Order.—Blattites, *Cockroaches.*

Antennæ very long, filiform, tapering, and many-jointed; head bending beneath the prothorax; fore-wings semewhat coriaceous, horizontal, one folding over the other, covering the hind-wings, which are folded beneath them; legs alike in structure; tarsi five-jointed: nocturnal; voracious; omnivorous; run rapidly; fly badly; do not leap. *Blatta.*

Situation at present doubtful.

Natural Order.—Thripsites, *Ticklers.*

Antennæ conspicuous, composed of eight joints; fore- and hind-wings linear, and of equal length; tarsi two-jointed. Very minute. Inhabit flowers, feeding on the farina. When running on the skin they cause an intolerable itching. *Thrips.*

Class V.—Hemiptera.

Imago, with the parts of the mouth only partially developed; the mandibles are without any horizontal motion, but elongate and slender, and, together with the maxillæ and tongue, are inclosed in a sucker, which is composed of the labium principally, but protected about by the labrum; this sucker is bent beneath the head and breast, excepting when in use, when it is usually thrust perpendicularly into the rind of vegetables, or skin of animals, to extract the sap or blood, which, in the class, constitute the food; the feelers are obsolete; all the wings are fully developed, and in the greater portion serve occasionally as organs of flight; the flight is, however, weak, and of short duration.

Stirps.—Cimicina.

Natural Order.—Cimicites, *Bugs.*

Antennæ elongate, conspicuous, four- or five-jointed; fore-wings with the basal portion coriaceous, the apical portions which cross each other membranaceous; the legs are of uniform structure, not formed for leaping; the tarsi are three-jointed: terrestrial; run fast; fly rapidly, but not far at a time; feed generally on the sap of vegetables, sometimes on other insects, and occasionally,

but apparently unnaturally, on the blood of vertebrate animals. *Cimex*,[1] &c.

Stirps.—Hydrometrina.

Natural Order.—Hydrometrites, *Water-bugs.*

Antennæ elongate, conspicuous, four- or five-jointed; fore-wings coriaceous, of uniform substance; hind-wings membranaceous; all the wings linear; legs of uniform structure, very long, not formed for leaping; tarsi three-jointed; body elongate, linear: aquatic, running with ease and rapidity on the surface of water. *Hydrometra, Gerris, Velia.*

Stirps.—Nepina.

Natural Order.—Nepites, *Water-scorpions.*

Antennæ very short, concealed below the head; fore-wings coriaceous, crossed at the apex; hind-wings membranaceous, completely concealed beneath them; fore-legs hooked, predatory; tarsi with a single joint; middle- and hind-legs not formed for swimming; tarsi two-jointed; tail armed with two long setaceous appendages: aquatic; carnivorous; crawl on aquatic plants, but do not swim. *Ranatra, Nepa.*

Stirps.—Notonectina.

Natural Order.—Notonectites, *Water-boatmen.*

Antennæ very short, concealed below the head; fore- and hind-wings as in the preceding; fore-legs unarmed, middle- and hind-legs formed for swimming; all the tarsi two-jointed; tail without appendages: aquatic; carnivorous; swim with ease, swiftness, and elegance; cannot crawl on aquatic plants like the preceding. *Naucoris, Notonecta, Corixa, Sigara.*

Stirps.—Cicadina.

Natural Order.—Cicadites, *Frog-hoppers.*

Antennæ very short, scarcely projecting beyond the head; fore-wings coriaceous, meeting with a straight suture; hind-wings membranaceous; hind-legs incrassated, formed for leaping; tarsi three-jointed; leap readily; fly badly. Inhabit vegetables, on the sap of which they feed. *Cicada, Cercopis, Membracis, Psylla,* &c.

[1] The *Cimicites* require further division. *See* M. de Laporte's excellent classification of them.

Stirps.—Coccina.

Natural Order.—Coccites, *Gall-insects.*

Antennæ hirsute, long, moniliform, many-jointed; fore-wings semi-coriaceous, of uniform substance; hind-wings wanting, or replaced by appendages similar to the halteres of *Diptera;* legs of uniform structure, not formed for leaping; tarsi two- or three-jointed in the male, with a single joint in the female; tail furnished with two long setæ. The females are apterous, and attach themselves to the bark and leaves of trees, on which they deposit their eggs, covering them with their bodies; in this situation the female resembles a gall, or casual excrescence of the plant. *Coccus.*

Stirps.—Aphina.

Natural Order.—Aphites, *Plant-lice.*

Antennæ conspicuous, elongate, seven-jointed; fore-wings deflexed, meeting over the back with a straight suture; hind-wings much smaller and shorter; all the wings membranaceous; legs of uniform structure, not formed for leaping; tarsi two-jointed. Infest all vegetables, sucking the sap: reproduction without union of sexes for many generations. *Aphis.*

Situation at present doubtful.

Natural Order.—Aleyrodites.

Larva oval, flat, and scale-like. Pupa changes within the skin of larva; is quiescent. Imago, with the antennæ filiform, conspicuous, and six-jointed; wings equally developed, both as to length and breadth, covered with a white, mealy substance like the scales of *Lepidoptera;* legs of uniform structure, not formed for leaping. Sits on the under-side of the leaves of the plants on which the larva feeds. *Aleyrodes.*

Division III.—Tetraptera Anisomorpha.

Larva and pupa possessing no uniform mode of metamorphosis, but assuming, in different Orders, that of other Divisions.

Class I.—Neuroptera.

Larva, with strong corneous mandibles moving horizontally, and six articulate feet, situated in pairs on the second, third,

and fourth segments; prehensile feet none. Pupa various. Imago usually with the organs of the mouth, and all the wings fully developed, and resembling net-work.

Stirps.—Termina.

Natural Order.—Termites, *White Ants*, &c.

Larva with long, filiform, multi-articulate antennæ; strong, corneous, and well-developed, and masticatory mandibles, and six elongate articulate legs: active, omnivorous, and apparently perfect, in one genus living in immense societies. Pupa isomorphous. Imago, with long, filiform, multi-articulate antennæ; strong, corneous, masticatory mandibles; wings fully developed, recumbent, reticulated; tarsi three-joints. (*Termes*), *Psocus*. The larva of a *Psocus*, which feeds on preserved insects in our cabinets, is called *Atropos pulsatorius* by some authors, and is said to make the ticking noise frequently heard in houses, and commonly known as the death-watch; in its perfect or winged-state it is not uncommon among old books, on windows, &c.

Stirps.—Perlina.

Natural Order.—Perlites, *Pearl-flies*.

Larva with long, filiform, multi-articulate antennæ; strong, corneous, masticatory mandibles; telum furnished with two long, setiform appendages; active, carnivorous, aquatic. Pupa isomorphous. Imago, with long, filiform, multi-articulate antennæ; strong, corneous, masticatory mandibles; wings fully and equally developed, reticulated, recumbent; the hind-wings folded; tarsi three-jointed. Inhabits the banks of running waters, and is a very favourite food for fish; flight nocturnal. *Perla*, *Isogenus*, *Nemoura*. *Sialis* has a necromorphous pupa.

Stirps.—Raphidiina.

Natural Order.—Raphidiites, *Snake-flies*.

Larva with filiform antennæ, and corneous, masticatory mandibles; active. Inhabits and feeds on decayed wood. Pupa isomorphous. Imago, with moniliform antennæ; corneous, masticatory mandibles; large porrected head; elongate prothorax; wings uniformly and fully developed, recumbent, deflexed, not folded, beautifully reticulated; tarsi four-jointed; telum with a seta: flight diurnal, in the sunshine. *Raphidia*.

NATURAL ORDER.—HEMEROBIITES, *Lace-winged-flies.*

Larva, with filiform antennæ; prominent corneous mandibles and maxillæ; sacciferous, carnivorous. Inhabits the leaves of vegetables. Pupa necromorphous; changes within the sack formed by the larva. Imago, with long, moniliform antennæ; corneous, masticatory mandibles, wings fully and equally developed, not folded, beautifully reticulated, deflexed; tarsi five-jointed; smells fetid; flies mostly in the evening. *Hemerobius, Chrysopa Osmylus.* (*Myrmileon* and *Ascalaphus* differ only in their singular pit-fall making larvæ and their clavated antennæ).

STIRPS.—PHRYGANINA.

NATURAL ORDER.—PHRYGANITES, *Stone-flies.*

Larva with short antennæ; corneous, masticatory; mandibles; sacciferous, aquatic. Pupa necromorphous, changes in the sack formed by the larva. Imago, with very long, multi-articulate, filiform antennæ; mandibles and maxillæ obsolete; fore-wings deflexed, very hairy; hind-wings ample, much folded longitudinally, not so hairy; tarsi five-jointed. Inhabits the neighbourhood of water; flies in the evening and during the night, and is a favourite food of fish. *Phryganea.*

STIRPS.—EPHEMERINA.

NATURAL ORDER.—EPHEMERITES, *Caddew-flies.*

Larva with long, filiform antennæ; corneous, masticatory mandibles; six articulate legs, and numerous lateral fins, which aid it in swimming, and which also serve to separate air from the water, and convey it to the trachææ; aquatic, carnivorous. Pupa isomorphous. Imago, with short concealed antennæ; mandibles and maxillæ obsolete; fore-wings fully developed; hind-wings small or obsolete; all the wings beautifully reticulated, erect, and meeting above the back; tarsi four-jointed; telum furnished with long setiform appendages; retains a superfluous skin after having attained its final form, characters, and even the power of flight; this skin renders the wings opaque, when shed they are more transparent. Flight in the evening, in company, rising and falling; a favourite food of fish, and a bait much in request among anglers. *Ephemera, Baëtis, Cloëon.*

STIRPS.—LIBELLULINA.

NATURAL ORDER.—LIBELLULITES, *Dragon-flies.*

Larva with short antennæ; corneous, masticatory mandibles; very elongate, jointed, and remarkable labium, furnished with preda-

tory, acute, mandibuliform palpi; aquatic, carnivorous. Pupa isomorphous. Imago, with minute antennæ nearly concealed; strong, corneous, masticatory mandibles; labium of moderate proportions; wings of uniform development, beautifully reticulated, porrected, laterally or erect, meeting above the back; tarsi three-jointed; flight rapid, well sustained; active, carnivorous. *Agrion*, *Libellula*, *Æschna*.

Situation at present doubtful.

NATURAL ORDER.—PANORPITES, *Scorpion-flies*.

Larva and pupa unknown. Imago, with long, filiform, multi-articulate antennæ; mandibles and maxillæ corneous, produced into a beak; wings of equal development, horizontally recumbent on the back; tarsi five-jointed; telum armed with an appendage resembling a lobster's claw; flight weak, of short duration, diurnal. Inhabits abundantly the woods and hedges of England throughout the summer. *Panorpa*, (*Bittacus*, *Nemoptera*).

ART. XXXVIII.—*Entomological Society.*

TENTH SITTING.—JULY 7.

THE SECRETARY read a paper, by Mr. Babington, upon the genus *Dromius*.

The SECRETARY read a paper by himself, describing a British Neuropterous Insect, and giving it a new generic name: the name escaped us.

The SECRETARY read a paper by M. Chevrolat, on a species of the family *Curculionidæ*, which he had received from St. Helena.

The SECRETARY read a paper by himself, on the Neuropterous genera *Acentropus* (Curtis), *Acentria* and *Zancle* (Stephens' Nom. 2d Edit.); the author considers these genera Lepidopterous.

The SECRETARY read the conclusion of the paper by himself and Mr. Templeton, on the genera *Lepisma* and *Podura*.

The SECRETARY read the title of a paper by himself, entitled "Notes upon Nomenclature;" but the President thinking the meeting had sat sufficiently long, it was withdrawn.